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Developing the Region in the Information Age: Information Society Technologies in Ireland and Europe.

being a Thesis submitted for the Degree of Doctor of Philosophy
in the University of Hull

by

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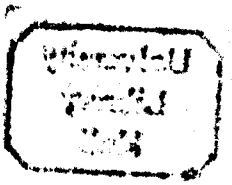

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Summary of Thesis submitted for PhD degree

by Patrick Collins
on

Developing the Region in the Information Age: Information Society Technologies in Ireland and Europe.

This thesis aims to contribute to a better understanding of regional development in the 21st century by looking at the effects of policy and the reality behind adapting to the information age. This work investigates four broad themes, the first of which takes a theoretical standpoint that lies at the interface between institutional and neo-classical approaches to development. These approaches are compared in reality through the different development policies chosen by the European Commission and the Irish Government. I use the Regional Information Society Initiative (RISI) as a vehicle of analysis to gauge the 'institutional turn' in EU policy making. This involves a comparison with policies in Ireland which have long favoured a more neo-liberal approach.

The second pillar of my work provides empirical evidence, contrary to technological determinists, that physical space and infrastructure is as, if not more, important in the information age as it was prior to it. This is closely related to the third theme which the national statistics of Ireland's Celtic-cyber-tiger and shows that Ireland after a period of rapid development is more divided socially and spatially than ever before. My final theme attempts to better define development in the information age by unearthing more concrete definitions for both 'information society' and 'information economy' and identifying the correct policies necessary for both.

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Abstract:

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Do mo clann agus mo cáirde, ach ar tus tá sé i gor mo Athair agus mo Mhathair, Brendán agus Máire O'Coilean, le haighaidh an grá agus chuile rud eile a thug siad dhom. Gur a míle a maith agibh.

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'You can't chose your family *and* friends', I am one of the lucky ones, I would and do choose all of them, and love them very much. Their help and inspiration in every way from the obvious to the obscure has made me indebted to them always. This work is dedicated to my parents Brendan and Mary without whose help and direction I dread to think where I would be.

List of Abbreviations:

IS	Information Society
IE	Information Economy
ICTs	Information and Communication Technologies
ISTs	Information Society Technologies
RISI	Regional Information Society Initiative
IRISI	Inter-regional Information Society Initiative
eris@	European Information Society Association
EU	European Union
NESC	National Economic and Social Council
NSD	National Software Directorate
IDA	Industrial Development Authority/Agency
EI	Enterprise Ireland
SFA	Small Firms Association
ISA	Irish Software Association
ISC	Information Society Commission (Ireland)
CSE	Centre for Software Engineering
Fás	Foras áiseanna Saothair, National training agency
GDP	Gross Domestic Product
GNP	Gross National Product
GVA	Gross Value Added
PPS	Purchasing Power Standard
ISI	Import Substitution Industrialisation
MNCs	Multinational Corporations
FDI	Foreign Direct Investment
SDC	Software Development Centre
PCs	Personal Computers
e-commerce	Electronic Commerce
BB	Broadband
VLSI	Very large-scale integration
AIT	Athlone Institute of Technology
DCU	Dublin City University
ITT	Institute of Technology, Tralee
NUI, G	National University of Ireland, Galway
UCC	University College Cork
UL	University of Limerick
R&D	Research and Development
RTD	Research and Technical Development
OECD	Organisation for Economic Co-operation and Development

CHAPTER 1: INTRODUCTION, AIMS AND METHODS.

Introduction

This thesis is concerned with the spatial implications of Information and Communication Technologies (ICTs) and the Information Age with which they are associated. Focusing on two different policy approaches, this dissertation investigates regional development in Ireland[1] and the EU over the same period of time. Irish policy makers have been unabashed in their pursuit of market oriented, supply-led economic and industrial policies in the information era. The European Commission has taken a somewhat different approach to regional development over the last 10 years. Using the European Commission's Regional Information Society Initiative (RISI) and the institutional, demand-led approach it embodies, I aim to compare two very different approaches to regional development in the Information Age.

The theoretical standpoint of this work therefore, lies at the interface between neo-classical and institutional approaches to regional development in the Information Age. Neo-classical approaches and variants of this such as the input/output models and one/multi-sector models have been a major influence upon regional policy during the twentieth century (i.e. Bradfield, 1976; 1988). Institutional approaches have breathed new life into the regional policy debate (for example the work of Cooke and Morgan, 1998; Amin and Thrift 1995; Hausner, 1995). In many ways the institutional approach can be seen as a direct response to some of the inadequacies identified in the market-led approach of the neo-classical school of thought.

Throughout this thesis both schools of thought are examined and compared on a multi-scalar level of enquiry from the regional to the EU level. It is this theoretical investigation/comparison that forms one of the four main pillars of my research, while also binding all four pillars together. My work is original in the way that it brings together these two theoretical perspectives to re-examine the regional policy debate in the twenty-first century through my focus on developing the region in the Information Age. It builds on the work of Dabinett (2001), Gillespie et al. (2001), Castells (2000) and Grimes (1999) in providing a critique of the orthodox policy approaches to

[1] Unless otherwise stated Ireland here refers to the 26 counties of the Republic of Ireland, thereby excluding the remaining 6 counties that form Northern Ireland

development in the Information Age, by better defining both the development objective and the theories that lie behind it. This thesis also addresses the on-going debate concerning methods and standards and evidence in economic geography (see Markusen, 1999 and Yeung, 2002). Statistical and quantitative inquiry is a better method of investigation when testing the market-led approach while a more qualitative approach enables better appreciation of the somewhat 'softer' institutional policies.

A second pillar of my work focuses on investigating the spatial expression of the new age. In this work I will show how the proliferation of Information and Communication Technologies (ICTs) has impacted on the development of regions across the European Union (EU) with specific reference to Ireland. In this work I show that while some regions have a new-found development trajectory as a result of engaging with ICTs, these tend to be the exceptions to the rule. I argue from the basis of empirical evidence that contrary to the technological determinists such as Batty (1993) and Hill (1988) that the new tools of the information age are unlikely to be the panacea of European regional ills. Incentives for firms using these new tools to locate in peripheral regions, such as lower land and labour costs are outweighed by the constrictions of peripherality, most notably the lack of telecommunications infrastructure in the case of smaller firms and the lack of critical mass in the case of larger ones.

Uneven spatial development is illustrated by a focus on Ireland and the Celtic Tiger phenomenon of the 1990s. Ireland and Irish regions prove to be an ideal case study for regional development in the information age because of how the country has become synonymous with growth in the information technology sector (Sweeney, 2000). This focus forms the third pillar of my research. Here I show how the well publicised growth figures behind Irish economic success are misleading for two reasons. First, there are geographic disparities behind Ireland's growth; in particular the growth of its high technology industries. Second is the dualistic nature of the success story. Growth figures in the software industry for example are, for the most part, accounted for by branches of large multinational operations which are involved in lower-value added production and contribute little by way of backward linkages with indigenous firms or high-level jobs in their localities.

The remaining main pillar of my research is an attempt to better define exactly what is meant by development in the Information Age. To this end I focus upon defining and differentiating the terms information society (IS) and information economy (IE). The development of either (and perhaps both) has been high on the political and social agenda for many regions and countries for the past number of years. However, at the same time there has been a tendency to assume both the IS and IE are one and the same thing. The result of this over-simplification is that many IS policies put in place, especially at a European level, have in fact failed. I will show how the pursuit of each, or both, of these entails a very different policy approach in the information age.

What distinguishes this thesis from other enquiries into the nature of regional development lies in its use of the interface between two very different sets of theories. I use these two theoretical ideas to investigate the policies that have been derived from theory and their particular regional development impacts. The recent turn towards the 'softer' approach of institutional theory runs through all the main pillars of my research, with my focus on the EU approach through the Regional Information Society Initiative (RISI). Comparing this initiative to those of the early 1990s in Brussels, and the approach to the information age taken in Ireland more recently, forms a very influential part of this work. In the case of Ireland many of its economic and industrial policies have targeted inward investment by attracting multinationals to set up there. These policies are neo-liberal in their leaning in how they rely on the free market and offer incentives to attract mobile capital. This contrasts with the more institutional/local approach of fostering indigenous development in their stead. The top-down approach to development in Ireland justifies my choice of my two case study regions which are part of RISI, which itself calls for a more bottom-up approach.

Both theoretical approaches imply very different spatial results. The neo-liberal approach in Ireland has led to a concentrated form of development in and around Irish cities, while the demand-led approach has implied a more uniform geographic development. I will show that this is a feature as prevalent in the information age as it was prior to it. Possibly more interesting is the delineation of the effects of both policy approaches in the new era. This work seeks a better understanding of current

economic development by segregating notions of the information society from those of the information economy. Both imply very different things; giving a better understanding of both enables regions and countries to make an informed decision as to which they pursue. The theoretical divide becomes most influential here in the way I examine how the goal of information economy is more easily attained through the top-down type policies of the neo-classical school of thought, while in attaining an information society the best policies to pursue are the bottom-up policies of the institutionalist school. The use of the wrong policy approach to achieve either outcome forms a large part of my critique in this work.

Structure of Thesis:

This introductory chapter deals with the aims and objectives of my thesis and discusses the methods employed. Chapter two is an overview of the literature that informs my work. This spans schools of thought from the neo-classical to the dirigiste[2], over the twentieth and twenty first centuries. The objective of this chapter is to explicitly explain the different theoretical approaches in order to create a better understanding of the policies that are examined in the remainder of the work. This is done by making clear the differences and the intersections of the neo-classical and institutional theories of regional development over the past 60 years.

The following chapter introduces the European element to my work. Here I focus on the policies of the EU in terms of innovation and adapting to and accessing the information society. This chapter sets out in chronological order the different approaches employed at the decision making level in Brussels. Most notable here is the evolution from innovation policies in the 1980s to the information society policies of the 1990s. Running parallel to this shift is the adoption a different theoretical standpoint by the Commission. The chapter lays out how policy makers have been

[2] In some economic literature the term 'dirigiste' is used to describe the economic policies of a centrally controlled government (see Storper, 1995). In the context of this thesis what I mean by referring to RISI as a dirigiste approach makes use of how dirigiste is employed by Holderness and Haywood (1998) and Sui (2000) - as a more adaptable approach that focuses on the sum of the parts rather than the whole and assumes no mathematical determinacy by seeing reality as non linear in its dynamics. Dirigisme here is set against the epistemology behind the mechanistic metaphor of Cartesian separation of the object from the subject which is inherently reductionistic which is seen in this work as informing the neo-liberal economic approach.

influenced by the theories set out in chapter two. Here, my distinction between the two theoretical approaches is seen in practice in how both theories have contributed to different policies.

This leads onto chapter four in which I outline the Regional Information Society Initiative (RISI) which my work focuses on as a reflection of the institutional turn in EU information society policies. This chapter is crucial to my overall analysis in how it makes use of RISI as a vehicle of analysis of the development of regions in the information age under innately institutionalist/dirigiste policies. I gauge the performance of all 22 RISI regions over the course of and after the initiative; employing both quantitative and qualitative methods in doing so. Special attention is given to my case study regions; the Southwest and Midwest of Ireland. These provide a springboard to the next section of my work as I compare the two regions with their European counterparts before comparing them with their national neighbours.

Chapter five moves on from this to bring the Irish focus to my work. Entitled 'Development of an Information Economy', this focuses on Ireland's development over the past 80 years, with the main focus on the last 20. Here I look at Ireland's economic and industrial policies which are heralded as bringing about Ireland's Celtic Tiger. In noting the policies pursued in Ireland over the said period, attention is given to their theoretical grounding. What becomes most obvious here is how Ireland started from a protectionist/nationalist stance and has undergone various processes which have seen it become one of the most open economies in the world with a staunchly internationalist view.

This leads on to chapter six which focuses explicitly on one of the key drivers of Ireland's economic success in the 1990s, the Software sector. Here, I question whether or not software can be seen as one of the key drivers of Irish economic success in the 1990s. What becomes clear is that while the references to Ireland as being 'Europe's Silicon Valley' (The Economist, 1997) are easy to apply, they are somewhat harder to prove. The rosy picture of the Irish software industry becomes slightly less colourful after some serious questions are asked of it. Not least of these is how such as spatially unrestricted industry became so geographically limited across Ireland.

Chapter six makes it clear how much Ireland has become an island of regions as a result of the boom in the 1990s. As a result of this, chapter seven charts Irish regional and industrial policy and how it has informed Ireland's development in the 1990s. Again theoretical influences are foremost in this investigation, and the divide between neo-classical and institutional approaches are noted on the national and regional level. As the second to last chapter, chapter eight reflects on some of the results of the previous seven chapters and seeks to better define regional development in the Information Age, by segregating information economy from information society. In so doing it compares the 'new' EU approach to the approach taken in Ireland and demonstrates that differing approaches to the same goal of developing the regions in the information age can lead to very different outcomes. Chapter nine concludes my work and discusses the key issues highlighted in my work.

Research Aims and Questions

The primary aim of this research is to evaluate the performance of the Irish regions in a national and an EU context (through RISI) and their development in the information age. The advantage of this approach is that with it I can decipher the geographic nature of the emergence of the Information Society (IS) on three different levels; the region, the nation and the supranational. I will track the emergence of the IS within Ireland and demonstrate the effect of Irish policy on regional economic competitiveness. I will also look at the EU approach to policy formation in the IS and examine the effects on two Irish regions relative to both their national counterparts (the six other regional authority areas of Ireland) and their EU counterparts (20 other members of RISI).

The literature that RISI draws from suggests that the region is in the best position to act on local knowledge and is also the most appropriate level upon which to build up social capital. I will seek to test the theory by comparing the 22 regions of RISI that are pioneering the institutional turn against the remaining five regions in Ireland that are not. This will help me interpret the consequences for policy both at the national level for Ireland and at the wider level of the EU. My work will be an evaluation of the RISI programme in itself and an investigation into the effects of RISI in a national

context of the two Irish regions in RISI and their performance relative to the rest of their national counterparts.

My work can be divided into two distinct parts. The first dimension comprises a study of the broad trend of increasing regionalisation across Europe, I examine the EU's recent innovative policies that aim to alleviate the disparities among regions. Taking RISI as an example of this, I have empirically tested the performance of the two Irish regions of RISI with those of the rest of the country. I will also be looking at the performance of the two Irish regions relative to the 20 other regions in RISI.

Secondly, I examine Irish policy decisions and the rise of regionalisation that has resulted from the Celtic Tiger. My aim here was to investigate Ireland's development as an information economy by looking at the economic policies pursued by the Irish government since independence; from early protectionism to becoming one of the most open economies in the world. After which I highlight the importance of Ireland's outward-oriented industrial policies, which bought foreign direct investment into the country. I also take an in-depth look at Ireland's Software sectors, one of the main beneficiaries of this investment, before looking at the geographical and policy contributions to it.

A primary aim of my work is to reduce what Markusen (1999) terms fuzzy conceptualisation. Here I will be critically appraising the Information Society, finding a tangible definition of it and testing that definition across the regions. As I mentioned at the outset, a single definition of the information society is very hard to construct. Indeed, there are those that argue that it does not warrant a definition (see Harvey, 1996; Liepietz, 1992). Regardless, the term Information Society is employed in numerous policy documents published by the European Commission as well as national governments. The ambiguous nature of this fuzzy concept makes it very easy to employ as a political tool. Unreal, befuddled and insincere waffling about some form of perfect society, even when it is well-intentioned, is a target of my deconstruction. My attempt to better define and identify development in the information age lends no credibility to prognostications which sometimes raise unrealistic expectations.

Running through both these aspects of my work are development issues in the information age. My approach tests for the presence of access as well as adaptability in regions in the new era. These two issues become key in later parts of my work where I attempt to better define the information society by segregating from it the information economy. A great deal of policy and discourse has fallen foul of defining both under the same umbrella. What I attempt to do is make clear differences between the two and note that the existence of one does not necessarily imply the existence of the other. The above aims can be distilled to form the four broad research questions below:

1. How different is the pursuit of economic development of regions in the Information Age? Does the age of new technology bring with it new development opportunities and can ICTs bring more prospects to less favoured regions, or do we remain on a similar development trajectory across the world whereby it will only be the most successful regions that will gain from the new tools offered in the information age?
2. What is the appropriate policy response for regions in the information age? Theory along with policy has undergone a shift in the past decade from focusing on the market to placing more emphasis on the social and institutional. This shift is evident in EU policy making circles but less so in Ireland. But what are the effects of these different approaches and which, if either is most suitable for regions in the information age?
3. What policies form the building blocks behind the well-renowned Celtic Tiger of the 1990s and exactly how did Ireland manage to attract some of the world's biggest high-tech industries? What is the truth that lies beyond the high annual growth rates in GDP? Can the software industry be considered the engine behind this growth and if so what implications, socially, politically and especially spatially has high-tech development had on Ireland and Irish regions?
4. In answering the above can we better define what it is that is meant by development in the information age? Looking at the approaches of different regions and the end results of different policies pursued can bring some clarity to the fuzziness that is developing the region in the information age?

Research Objectives

In the first instance, this thesis is a study of regional development in Europe in the information age with a particular focus on Ireland. The work is inspired by the failure of a proliferation of EU policies throughout the 1990s. I pay reference to these information society initiatives and highlight their deterministic nature as a major weakness. Running through my work is an attempt to define more clearly the 'information society', a concept that has suffered from a lack of clarity which enables policy makers to merely pay lip service rather than devote to it anything of substance. While the Regional Information Society Initiative is not without blame in its lack of definition of the term, it does look at development in the information age in a different way to the EU programmes that went before it. RISI takes a refreshing view of regional development in the information society, by concerning itself firstly with the demand side. In so doing it proposes a bottom-up approach, demonstrative of what writers such as Morgan (2001) term the 'institutional turn' in EU thinking.

In looking at the 22 regions that were part of RISI, I attempt to show the effects/results of this novel approach. Through use of both my qualitative methods (survey material) and quantitative methods (statistical interpretation of IS indicators) I have mapped out the evolution of the member regions over the time period of the initiative. Special note is taken throughout of the two Irish regions, the Midwest and the Southwest, both of which were relatively successful in the initiative. These two case study regions also act as lynch-pin in my comparison of the development trajectory embodied in RISI with the development path pursued by Ireland. The role that these regions play explain why I deal with my two case study regions at a relatively early stage of my work. The comparison on a theory and policy level of the top-down vs. bottom-up development path is played out in reality by comparing the eight regional authorities of Ireland with the 22 regions of RISI, while the Midwest and Southwest regions were subject to both approaches.

Ireland's development over the boom years in high-tech industry forms a significant part of my work. Survey material and statistical interpretation are also used in my investigation of the Celtic-Tiger phenomenon. I highlight the economic policies pursued which were seen as incremental in creating a favourable climate for such

figures. As the software industry is seen as the pillar of the Irish success story, my work analyses the industry in Ireland and shows it as two-tiered, in terms of the gap between multinational and indigenous companies as well as being severely spatially restricted, with the vast majority of firms situated in and around Dublin.

These two symptoms are seen as direct results of the pursuit of neo-liberal top-down policies in Ireland. My work highlights a suspicion of the terms 'glocalisation' in Ireland, because of the lack of linkages (economic or social) between foreign and indigenous software firms. Secondly my work provides empirical evidence of the stubborn nature of the geography which many writers claim is dead. I show how it has become an Ireland of regions, now possibly more than ever. This is one of the reasons that Ireland proves to be a perfect test-bed for regional development in the new age, post-Celtic-tiger, being demonstrative of the inegalitarian outcomes of the pursuit of a deterministic top-down approach to development.

My final objective is to show that the result of this development path pursued in Ireland has created a robust information economy in Ireland in the absence of an information society. My work shows that it is the dirigiste approach as seen in RISI with its demand-led take on development that is more attuned to creating an information society. In so doing I demonstrate that the RISI regions (including the two Irish regions) through the emphasis placed on local-needs, learning and collaboration are more able to adapt to the information society. Conversely the remainder of the Irish regions place the emphasis on access in the information age. Two different approaches imply two different outcomes. The economic boom that occurred in Ireland will no doubt be extremely attractive to policy makers that seek to emulate the tigerish growth figures, yet as this work shows these figures have come at a cost. So however enticing an information economy may look, it can only be seen as a short-term goal, the goal of developing a society better able to adapt and succeed in the information age, is an objective for the longer term.

The Approach

In the context of contemporary literature my approach crosses the line of the two recent approaches in economic geography: economic geography as practised by

geographers; and the new economic geography or economics in geography. Contemporary Economic geographers typically rely on realist explanations that take direct account of the locally embedded socio-institutional contexts of economic agglomeration and development. Economists on the other hand still typically rely of the use of statistical models and econometric testing of empirical results. My approach critiques the weaknesses of both, developing from this a more robust methodology for my research.

In my work I will attempt to cross the division over the representation of geography. This division has bought with it critiques from both sides. Writers like Martin (1999), Peck (1999) Thrift and Olds (1996) and Amin and Thrift (1999) who consider themselves to be economic geographers, accuse the 'new' economic geography of sacrificing empirical realism for abstract universalism. They argue that for the 'new economic geographers', regions, cities and locations are just points along a hypothetical linear economy or abstract places in an ideal-typical geometric landscape. Real communities in real historical, social and cultural settings with real people going about the 'ordinary business of life' (as Alfred Marshall once described economics) do not figure in the 'new economic geography' models (Peck, 1999).

These geographers claim that regions are highly complex, socially and economically produced entities. They are not pregiven or fixed. Neither are they built up by the simple grinding out of deterministic mechanisms of increasing returns or simple trade-offs between centripetal or centrifugal locational forces. Regions cannot be reduced in this way. The difference, according to Ron Martin, cannot be captured in a model's 'initial conditions'(1999).

Economists like Paul Krugman (1990) have been robust in their criticism of what economic geographers do, arguing in particular that the geographers' work lacks clarity and rigour, that fuzzy notions such as 'Post-Fordism' provide little incisive insight, and that regulationist and deconstructionist ideas lead down a theoretical 'cul-de-sac'. In a scathing review Ann Markusen (1999), a geographer herself, decried what she perceived as economic geography's reliance on fuzzy conceptualisation. She defines a fuzzy concept as one which posits an entity, phenomenon or process which possesses two or more alternative meanings and thus

cannot be readily identified or applied by different readers or scholars. Therefore, in literature framed by fuzzy concepts, researchers may believe they are addressing the same phenomenon but may actually be looking at quite different ones.

My work develops upon that of Markusen and others like Dunford (1993) and Dunford and Ashiem (1997) in attempting to cross the theoretical divide between economic geography and geographical (spatial) economics. I employ elements from both perspectives to follow a 'third way' approach. My work is placed in the middle ground between the 'top-down' (model building) and the 'bottom-up' (empirically grounded) perspectives of both economics and geography. My analysis of regions in this context provides a much greater insight than an analysis using either approach in isolation.

Comparisons between the neo-liberal and institutional approaches to development in the information age are central to my work. The comparison takes place on three different levels, theory, policy and practice. The methods involved in comparing these distinctly different approaches also vary. The neo-liberal approach has economics at its heart, for this reason I employ quantitative methods to appraise neo-liberal policies. The goal for the economic approach is to make regions better off in terms of GDP (Gross Domestic Product) and the main determinants behind this income figure. In chapters three through seven I highlight the characteristics and effects of this approach by carrying out statistical analysis of both the RISI[3] and Irish regions. Simple statistics such as basic GDP and GVA (Gross Value Added) figures are employed to test the wealth of the regions. Against this a number of determinants such as innovative capabilities and learning are correlated to determine the factors most important to development in the information age.

Measuring the impact of the institutional approach involves employing different methodological tools. For the institutionalists the emphasis is not so much on economy but on the social factors that drive economic growth. Statistics for the degree of networking or collaboration are simply not available therefore I make use of

[3] It is important to note at this stage that my analysis of RISI is for the most part based on the theoretical approach it implies. As an initiative itself, relative to other EU Information Society initiatives and policies it is small in terms of funding and scale.

qualitative methods in attempting to appraise the impacts of dirigiste policies. To this end I make use of data and quotes which have been obtained through both interviews and surveys. In some cases qualitative results may be shown in graph format for ease of interpretation. This method enables me to better account for the effects and opinions of the dirigiste approach in the regions. By simply asking the region's main actors about the presence of collaboration among firms and the degree of institutional thickness there, creates a better understanding and makes these sometimes slippery notions much more tangible. The following section of this chapter deals with both methodological approaches in greater detail.

One final note of my approach regarding my case study regions. The rationale for dealing with my case study regions at a relatively early point, (chapter 4 then throughout the following four chapters) is that both regions act as an overlap of theory and policy in practice. The two regions are foremost subject to national policies (top-down) and secondly subject to the policies of RISI (bottom-up). For this reason it is necessary to examine their performance throughout my comparison of the two policy approaches being as they are subject to both and act as a benchmark for each. The idea to approach my examination of these regions in this way was not as originally planned. At the outset I had planned to compare the two case study regions with two other Irish regions that were not part of RISI. The rationale here was a comparison of policy-on (Southwest and Midwest) with policy-off (Midlands and West) regions. It was hoped that I could view the effects of the institutionalist approach vis-à-vis the non-RISI regions in which no similar policies were being pursued. After carrying out my research through interviews and surveys, I decided that this comparison was futile such was the proliferation of bottom-up initiatives in my alleged 'policy-off' regions.

Quantitative and Qualitative Methods

"Evidence, broadly speaking, is fundamental to the credibility of contending theories of regional development, and yet our standards of evidence seem to have slipped dramatically in the past decade. Many published pieces would benefit from a map or a table of summary statistics setting the topic in context"

(Markusen, 1999:862)

In this thesis I have employed qualitative and quantitative methods. Qualitatively, I have made use of interviews and questionnaires within the regions to investigate the respondent's opinions on the IS. This usually involved questioning regional actors on the potential for getting involved in the IS along with the barriers to success in the information age. The quantitative approach involved taking stock of many different information facets, such as, telephony penetration, existence of broadband infrastructure, PC/Internet usage per region, patent applications, R&D expenditure etc. Such an inventory was necessary at the outset to see which regions had a better chance of becoming more competitive in the IS. The aim was to demonstrate how the emphasis on building the IS had shifted to learning and knowledge (particularly tacit). This involved taking stock of the institutional thickness of the regions, an example of which can be looking at the interactions between centres for learning and education and R&D sections of firms. I then went on to compare the results of the two different sets of regions.

Quantitative analysis took place on three separate levels; from the first to the third the spatial scale of the analysis decreases as the complexity of the models increases. The first level of analysis was simple interpretation of data. This was compiled from the READS database (www.r-cade.ac.uk) and Eurostat's regional database for EU data and from national and regional statistics published by the Central Statistics Office for Irish data. The main socio-economic indicators of each region were compared with each other over a time series.

In a national context, I traced the evolution of the 'Celtic Tiger' via national economic statistics. This enabled me to better understand the policies that had bought about Ireland's new found wealth. Looking at regional statistics I compared them both to national statistics and against economic policies to identify the recent rise in regionalisation within the state. In a broader context, but on the same scale of the region, I analysed the similar trend towards regional divergence in Europe as a whole. In examining policy on this level I focused on highlighting any impacts of the more recent innovative policies and initiatives like RISI.

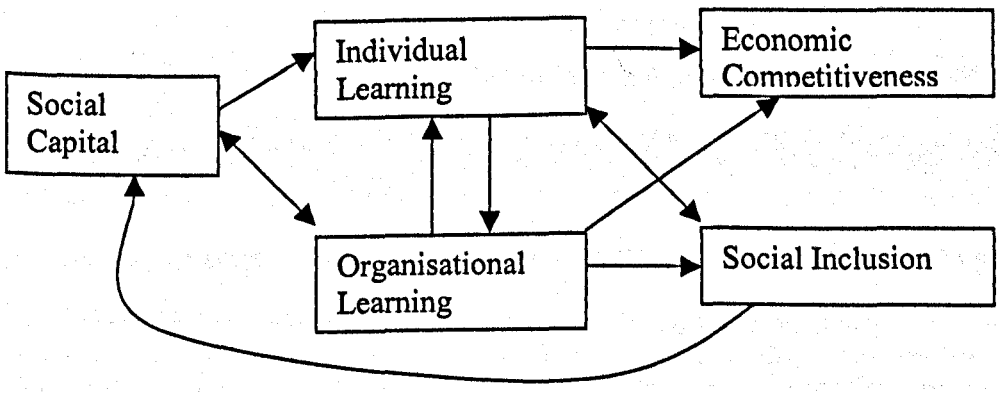
The second round of analysis probed deeper into the region and attempted to discover the regions' weaknesses and strengths. This analysis was more quantitative than that

which went before, but again involved all regions. This round can be split in two according to the different interpretative techniques I made use of. These can be broadly divided into correlation statistics and simple spatial econometrics.

I incorporated all 22 RISI and seven Irish regions in this, thus enabling less abstraction than focusing on one or two. This involved deciphering the key economic elements of regions in the IS. *Correlation* between economic facets such as GDP, Research and Development expenditure and patent applications, and the industrial mix of regions, helped enhance my picture of all the regions. As already mentioned, highlighting the learning ability of the region was also a primary research aim, as was its correlation with that same region's ability to enter the IS.

Employing statistical analysis leads to a better evaluation of the regions' performance than simply studying the secondary data without any analysis. This helped me explore the relationship between learning (in its various forms) and economic performance at the regional level. This also showed how well the regions I am focusing on have 'informationalised' and how exactly they have accomplished it. Correlation helped highlight those factors that have been most incremental in bringing about increased regional competitiveness and those which have not. Correlations between economic competitiveness and policies pursued (such as liberalisation of the telecomms sector, RISI etc.) also proved helpful in their evaluation.

Figure 1.1 Social Capital and Innovation Derivation



As we can see from figure 1.1 individual learning and Organisational learning are key inputs to the 'learning region model' underpinning the crucial process of innovation.

Both are dependent on the nature of institutions (social capital). Economic competitiveness and social inclusion are the (hoped for) goals/outputs. My quantitative analysis involved empirically testing the above schema in both the context of Irish and RISI regions as seen in Chapters four and six.

Location Quotients were also employed to this end. The use of this method will enable me to pick out the industries/sectors of importance to the region. By making use of Location Quotients (LQ) I deciphered the industrial mix of the regions, in so doing I was able to compare the LQ to IS adoption, and deduct the necessary mixes for regions to perform competitively in the IS.

Key Method 1 - σ Convergence and the use of Gross Value Added

Most empirical convergence studies employ both σ and β measures of convergence. Since it is generally held that not only is it necessary to investigate whether the dispersion of living standards has decreased over time, it is also important to access the extent of intra-distributional mobility (see for example Barrow and Sala-I- Martin, 1996). In this study, due to the small sample size, meaningful estimates of β convergence were not feasible. However, as a visual aid, graphs of initial levels of living standards in the regions compared to subsequent growth of living standards are presented.

The chief measure used here is the σ convergence measure σ_t equal to the coefficient of variation of $y_{i,t}$, where **y** is living standards and **i,t** represent regions and time respectively. The coefficient of variation is calculated as the standard deviation of $y_{i,t}$, divided by the mean of $y_{i,t}$. If $\sigma_{t+T} < (>) \sigma_t$, then σ convergence (divergence) is present between **t** and **t+T.** In addition, the rate of σ convergence may be calculated as the percentage change between σ_{t+T} and σ_t, where a negative (positive) value implies convergence (divergence).

In addition, in order to achieve a fuller understanding of the extent of both the convergence process and intra-distributional mobility of regions, the gap between each region and the national average is calculated as $y_{i,t}$ / Mean $y_{i,t}$, and compared to

$y_{i,t+T}$ / Mean $y_{i,t+T}$, where Mean y_i is the unweighted average of regional living standards. Analysis of these gaps and how they change over time also facilitates the identification of outliers and changes of rank order in the distribution.

Decomposing Irish Regional Living Standards: 1960-1998

Up to the mid-1980s Irish economic performance had generally been poor (Kennedy, Giblin and McHugh, 1988 and Lee, 1990), but since then there has been a marked turnaround which has been attributed to a number of factors. These include the fiscal stabilisation of the late 1980s, EU structural funds, demographic change and increases in labour market participation, the increased educational attainment of the workforce, continued Irish success in attracting FDI and the wage moderation and peaceful labour relations of the last decade (for example, Bradley, Fitzgerald, Honohan and Kearney, 1997; Barry, 1999; and Krugman, 1997).

The analysis conducted by O'Leary (1999) demonstrates the importance of allowing for the effect of the location of FDI on regional output and income in the 1990s. The regions with the greatest relative concentration of FDI, namely the Border and Southwest, have been severely affected by multi-national profit *outflows*. Income per capita in these regions has been substantially lower than output per capita in the 1990s. This compares to 1960, when there was a net factor inflow due mainly to emigrants' remittances, and in 1979, when a relatively small net outflow occurred mostly due to debt repayments. This is why O'Leary sees it as important to maintain the distinction between regional output and income.

But there are a few disagreements about the best approach to pursue.
According to O'Leary the safest course is to use measured output to estimate productivity. How has Gross Value Added (GVA) per worker differed between regions in the 30 odd years? Has productivity growth been widely dispersed or has it been more marked in urban regions? To what extent has labour productivity growth contributed to the growth and convergence of regional living standards in Ireland?

Bradley, Fitzgerald, Honohan and Kearney (1997:45) proceed to analyse the contributions of productivity and demographic factors on the growth of living

standards in Ireland as a whole since 1960[4]. Living standards, measured as Gross National Product (GNP) per capita, is decomposed into labour productivity (measured as GNP per worker), the employment rate, the participation rate and the age dependency ratio as follows:

$$GNP/N = GNP/L * L/LF * LF/N_{1564} * N_{1564}/N \quad (1)$$

Where, GNP is employed both as a measure of income and output, N is total population, L is total employment, LF is total labour force, N1564 is the total population between 15 and 64 inclusive.

It is shown that variations in the employment rate, the participation rate and the dependency ratio have also played an important role in explaining the change in aggregate living standards. Thus, during the 1960s and 1980s increasing unemployment and falling participation had a negative effect on living standards. However, during the 1990s rising productivity was accompanied by increases in both the employment and participation rates, and decreases in the age dependency ratio, which boosted living standards (O'Leary, 1997: 45)

The 1970s was the decade of Ireland's 'baby boom' it was also the same decade that Ireland witnessed net immigration for the first time. Steadily declining marriage and fertility rates and the return of emigration slowed the rate of population increase during the 1980s and early 1990s. An important feature of the recent population experience is the rising educational attainment of the adult population. This rise was driven by the introduction of free secondary education in 1967. More recently there has been a major expansion in third level education. These improvements have affected demographic behaviour during the last two decades, culminating in rising participation rates, especially among females, and falling age dependency (Fitzgerald, 1997).

[4] It should be noted that studies of international convergence have seldom distinguished between productivity and living standards, often assuming that growth in the former automatically results in growth in the latter. However, studies of inequalities of living standards within the EU from a policy perspective, have emphasised the role of demographic factors as well as productivity in driving living standards (for example see Dunford and Asheim, 1997)

In summary, a decomposition based on a combination of the approaches employed by O'Leary (1999) and Bradley, Fitzgerald, Honohan and Kearney (1997) is used here as follows:

$$I_{i,t}/N_{i,t} = I_{i,t}/O_{i,t} * O_{i,t}/L_{i,t} * L_{i,t}/Lf_{i,t} * Lf_{i,t}/N1564_{i,t} * N1564_{i,t}/N_{i,t} \quad (2)$$

Where I is regional income or 'GNP' as measured using the 'top-down' method developed by O'Leary (1999), O is GVA, N is total population, L is total employment, LF is total labour force, N1564 is total population between the ages of 15 and 64 inclusive, I refers to each of the 7 regions and t to 1960, 1979 and 1996.

Labour productivity (O_i/L_i), on the rate of σ living standards convergence (divergence) for the years 1960 to 1979, σ_t is recomputed for each year after removing regional differences in O_i/L_i. If the resultant rate of σ convergence (divergence) increases compared to the observed rate, then it can be concluded that O_i/L_i has a divergent (convergent) effect. If the resultant rate decreases, then it has a convergent(divergent) effect. The size of the convergent (divergent) effect may then be calculated as the difference between the rate of σ convergence (divergence) and the rate of σ convergence (divergence) that results after differences in O_i/L_i have been removed.

The use of counterfactual experiments in this way is indicative of the proximate causes of the degree of living standards convergence (divergence) observed. By isolating the effect on the overall degree of living standards convergence (divergence) of regional differences in each of the components of an accounting identity (Eqn, 2), only an approximation of the nature and importance of effects are being investigated. Underlying causal mechanisms are not uncovered by this method. However, the method does have the potential of indicating avenues for future research into the ultimate causes of the living standards convergence performance of regions.

Key Method 2: Revealed Regional Summary Innovation Index (RRSII):

The RRSII tries to take into account both the region's relative innovative performance to the EU mean as the region's relative performance within the country. It makes use of several indicators to test innovative capabilities at the regional level. For this two indexes are calculated at the national and EU level of which the mean value is taken for the RRSII:

- The average of the indicator values indexed to the country mean (RNSII: regional national summary innovation index):

$$RNSII_j = \frac{100}{n} * \sum \frac{X}{Y}$$

- The average of the indicator values indexed to the EU mean (RESII: regional European summary innovation index):

$$REUSII_j = \frac{100}{n} * \sum \frac{X}{EU}$$

Where X_{ijk} is the value of indicator i for the region j in the country k, Y_{ik} is the value of indicator i for country k, EU_i is the value of indicator i for the EU, and n is the number of indicators for which regional data are available. The RRSII is then calculated as the unweighted average of the RNSII and the REUSII.

As will be seen in Chapter 3 the revealed regional summary of innovation index as used in the European Innovation Scoreboard is an aggregate of the following indicators:

- Tertiary Education
- Life-long learning
- Employment in medium/high-tech manufacturing
- Employment in high-tech services
- Public R&D expenditure

- Business R&D expenditure
- High-tech patent applications

An innovation score is thus accorded to each EU region at the NUTS 2 level (see chapter four) which I used for comparisons and correlations. In Chapter 4 I again employed these scores as a weighting variable for regional performance in the IS, placing more weight on the first indicators. Using computer and internet figures for the national level I made use of the adjusted RNSII to derive a regional score. A robust methodology for my research comes out of my willingness to use this type of analysis in tandem with a more qualitative approach to the following questions, enabling intensive and extensive analysis.

The various merits and drawbacks of qualitative and quantitative methods in the social sciences have been discussed in numerous methodological texts (Dicken, 1993; Valentine, 2001; Peck, 1999). What arises from these discussions is that no one method is to be valued above another, rather the particularities of the research should drive the methods chosen. Qualitative analysis in this work therefore took place in its own right and as a forerunner and in tandem with quantitative analysis. It can be broken down into five parts:

1. Survey/Questionnaire to all Irish regional authorities
2. Survey/Questionnaire sent to all the project leaders of the 22 RISI regions
3. Qualitative interviewing of members of the Steering Committees and other key players in the two case study regions (using snowballing)
4. Qualitative interviewing of actors in a similar position in other Irish regions
5. Qualitative interviewing of policy makers in Dublin - through conference participation in Brussels

The first survey allowed me to compare the statistical disparities among Irish regions with the reality of disparity. This survey enabled me to take stock of all IS initiatives/policies, both domestic and European, pursued within the Irish regions. The final section asked for some form of opinion of these policies/initiatives and their effect on the 'informationalising' of the region. In the context of a country that has

been submerged in EU policies to initiate better economic performance, Ireland proved a valuable test-bed for evaluating EU policy making.

The second survey involved questioning the project leaders in RISI on their participation in the initiative. This was by way of evaluating the initiative and finding out exactly how well theory transformed to practice in the broader context of Europe. In collaboration with the strategy and action plans of the regions, this gave me a good idea of how the 'institutional turn' in EU IS policy has performed in reality. The general aim was to see whether RISI and the theoretical approach it implies proved to be any help for regional ills. Both of these surveys were also helpful to the end of examining what the Information Society means by testing the RISI's aim of awareness raising of the IS in regions in the different approaches of the 22, and how this translates into their understanding of the IS.

Textual - discourse analysis

The survey was supplemented by qualitative interviewing. This gave a much greater insight into the internal working of the initiative and interviews of how the policy makers (those responsible) view RISI, and the 'institutional turn' it represented. Interviews held in the case study regions were useful for gauging the Irish situation. Using semi-structured interviewing helped build a more robust picture of the regional response to IS and highlighted determinate factors of 'informationalisation'. Qualitative interviews are often cited as a means of gaining greater insight into the respondents' feelings, experiences and beliefs. Miles and Huberman (1994) argue that there are a number of instances when qualitative methods are valuable. Such as enabling local grounding and substantial depth; key requirements when organisational and human processes are observed.

I also developed a meta-evaluation of Irish policy influencing regional development in the information age, through the interviewing of policy makers. Members of the IDA and the National Software Directorate along with other policy makers were targeted in my research in Ireland. One of my main aims here was to assess what knowledge at the national level there is of the regional performance in the Irish

regions. It was interesting to see whether the policy makers in Ireland had taken much note of the recent turn in the European approach to regional development in the IS.

I was fortunate in that I had already made preliminary contact with some of my proposed interviewees. From there I employed the 'snowballing' technique of interviewing. This term describes using one contact to help recruit another contact, who in turn can put me in touch with someone else (Valentine, 2001). As the term implies, through this method, recruiting gains momentum or 'snowballs' layers of contacts are built up. This method proved extremely useful in approaching both interview sessions. I also make use of quotes and informal interviews of participants from a conference attended in Lille (Nord-Pas-deCalais) in 2001 concerning the regional approach to ICTs and spatial development.

Response Rates and Interview Interpretation

A copy of the questionnaire sent to the Irish regional authorities can be seen in appendix 1A. As can be seen it is a mixture of open and closed questions requiring brief explanation or ranking respectively. The questionnaire was split into three separate sections, the first of which involved defining the region. Here questions were asked about the impact of the authorities on regional development and the impact on them of national policy. Issues of scale were also explored here. The second section dealt with the Celtic-Tiger Phenomenon, asking what effect the key regional actors perceived it as having. This section also dealt with the importance of the Software industry to the regions while also gauging their thoughts on the information society. The third section deals with information society initiatives on a national and EU scale. Here respondents are asked to rank initiatives and ask how initiatives can better enable a region to adapt to the information age. Supplementary information was given to the regional authorities explaining the RISI initiative and the focus of my study.

The questionnaires were sent out in early July 2002 to the eight regional authorities of Ireland. The response rate can be considered excellent with all regions returning the questionnaire by September 2002. The results were then input into the social science statistical package, SPSS for analysis.

The second questionnaire was sent to the project directors of the 22 RISI regions. A copy sample can be seen in appendix 1B. This was also split into three separate sections, the first of which dealt with RISI itself, questioning success and particular parts of the project that were of most benefit. Questions were also asked on how RISI compared to other IS initiatives that the region was part of. The second section focused on particular parts of the projects and probed deeper into the degree and type of networking ongoing in each and between each authority. The final section dealt with broader regional issues such as the autonomy of the regions as well as the impact of EU contributions, the industrial make up of the regions, general collaborations ongoing and attitudes towards the information society. Responses to these surveys, sent out at the same time as the first questionnaire, were not as comprehensive, with a 45% rate of response. On the plus side, regions from each of the main areas in Europe (Scandinavia, Northwestern, Central and Southern) responded.

Interviews were carried out in the second half of 2002; in all 50 interviews were held with actors across Ireland (see appendix 2 for list). Interviews lasted an average of 45 minutes and were informally held. Being semi-structured I went into each interview with a set of general questions to both begin and bring the interviewee towards the issues of interest to me. Generally, the interviews started with some simple questions about the organisation and that person's role within it. These questions varied according to the type of organisation. All but two of the interviews were recorded by Dictaphone, these two interviewees preferred to remain anonymous. For this reason, none of the names of the interviewees are listed (except in the case of national Ministers) in their stead is the name of the organisation where they are employed and their job title.

In total both my quantitative and qualitative methods combined have given me a much clearer understanding of my subject area. Using both in combination has helped me make a more robust argument in the following chapters. I am confident that these methods have helped me better demonstrate the nature of the new geography of the information age.

CHAPTER 2: THE REGIONAL RENAISSANCE: LITERATURE REVIEW

Introduction

The debate around how best to explain regional economic success (and failure) relates to finding the most appropriate way to understand the form of relationships between economy, society and also the most appropriate spatial scale, form and content of policy action. The regional debate has made a comeback and it now sits at the theoretical and political fore. For too long regionalism had been neglected in favour of both the nation, under state-led policies, and the global, under market-led policies. It is now recognised by both theorists and policy makers that regions are fundamental sites upon which to convene and capitalise on capital flows (Castells and Hall, 1994). What we are witnessing is the regional renaissance (Storper, 1997). This renaissance forms the main body of this chapter and how it has bought with it a theoretical and policy co-evolution, where both are very closely bound together.

In what follows I will attempt to lay out the evolution of regional economic theory over the greater part of the 20th and early 21st centuries. In the section dedicated to policy I show how theory has influenced regions in practice. As will become clear, regional studies is still evolving, constantly shifting to a 'fresher' school of thought, a fresher paradigm better able to explain the anomalies than the ruling orthodoxy. It is on this basis that I have structured the following section. I will highlight the dominant schools of thought in regional studies, those which enjoyed much influence in the policy arena, but also those, which by cogent critique, fell by the wayside to be replaced by a newer orthodoxy better able to deal with reality.

A review of the literature forms an integral part of any piece of research. Here I look at different schools of thought and highlight how ideas about how to best develop a region in the information age compare and contrast. I refer to some distinctly different approaches, from the neo-classical to the dirigiste, but each of the theoretical stand points I allude to are worthy of recognition not least because of how they inform policy. An historical grounding of how theory has evolved is also an important element of this

chapter where as we shall see contemporary policies and practices in regional development bear a striking resemblance to theories considered the dominant orthodoxy as much as 50 years ago. What should also become clear by the end of this review is that there are two particular schools of thought that are of special interest to this work; neo-liberal and the institutional. It is the diametrically opposed nature of each and the very different impacts of the policies that both advocate that form a central pillar of this thesis.

The Neo-classical approach to regional disparities

Neo-classical theorists such as Bradfield (1976) emphasise the role of labour supply, the capital stock and technical progress in the growth process. This approach draws heavily on the assumption that the market allocates resources efficiently and that regional disparities in productivity growth are essentially a result of the gains accruing from the relocation of resources to their Pareto-optimal level. As with most neo-classical models, the model for regional development starts with a simple state: the more complexity added the closer to reality it becomes. For this reason we start with a one-sector growth equation with no technical change.

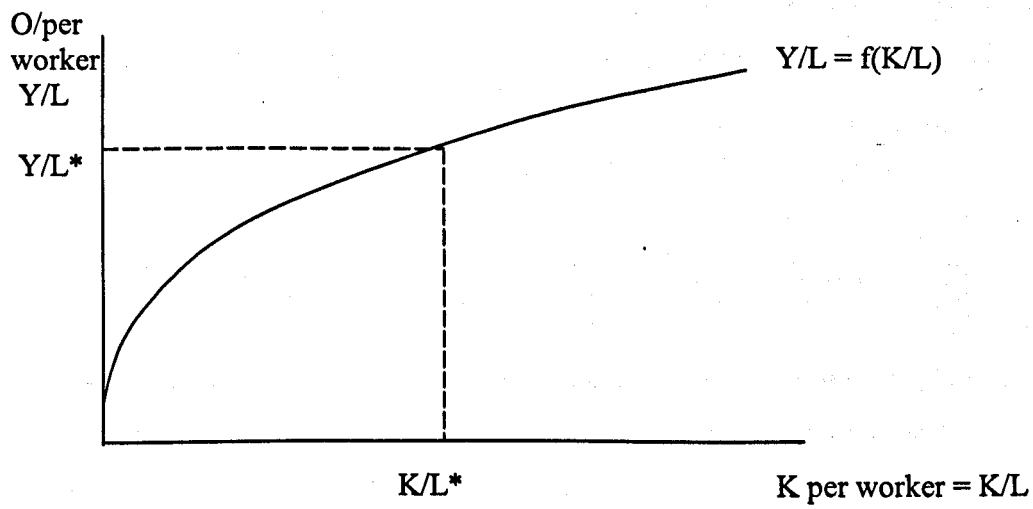
The aggregate production function lies at the heart of neo-classical growth models (see Figure 2.1). In an economy where there is no technical progress (TP), output is determined by capital and labour inputs. This relationship can be expressed in general form as follows:

$Y_t = F(Kt, Lt)$

Where: Y = real output; K = stock of capital; L = Labour force; T = time subscript

Finding the equilibrium position in the model shows us that output per worker can only increase if capital growth exceeds the growth of the labour supply. In other words, output per worker can only increase if the capital/labour ratio of this region increases. Logically, it follows that output per worker will increase as each worker is provided with more capital equipment, thus implying *Capital Deepening*.

Fig. 2.1 – Output per worker and the Capital/Labour ratio



Y = F(K,L) implies Y/L = f(K/L) provided F(K,L) is homogenous of degree one. A Cobb-Douglas production function with constant returns to scale (CRS) is such a function.

The process cannot continue indefinitely because of diminishing marginal returns on capital. When the marginal product of labour has fallen sufficiently low, net investment will go to 0 and gross investment will be just sufficient to maintain the existing stock of capital. The K/L ratio will then be at long run equilibrium K/L*, here there will be no incentive to increase K/L ratio further.

Three conclusions are reached at this preliminary stage in the neo-classical model:

1. Output grows without limits as the supplies of K and L increase
2. Output per worker can increase only if there is capital deepening
3. When the K/L ratio reaches its long run equilibrium, there will be no further increase in output per worker

More realism can be built into the model by allowing for the effect of *technical progress* (TP) on output growth. This extended version of the one sector neo-classical model has the attraction that it allows for the possibility of a steady growth in output per worker. Thus regional disparities in the growth of output per worker are explained by regional differences in the rate of TP and by regional differences in the growth of the K/L ratio.

Neo-classical regional growth disparities occur not only because of regional differences in the indigenous growth of K and L, but also as a result of *interregional factor migration* (Lewis, 1955). Under conditions of mobile capital and labour, regions with a high K/L ratio have high wages and a low yield on investment so K will outflow and L will inflow and vice versa – low wage regions will attract capital and lose labour, whereas high wage regions will attract labour and lose capital. Since K/L ratio will be increasing in low wage regions this will imply that output per worker will be gaining faster there. If capital is more mobile than labour (as seems likely) the low wage region will experience the fastest output growth because capital will be moving into these areas faster than labour is moving out (Johson, 1966).

What of the mobility of TP? There is empirical evidence to show that technical diffusion is not instantaneous between regions. Some regions appear to be innovation leaders. They are the sources of the basic inventions and take the lead in applying these inventions in the form of new products or in the form of new production methods. Although TP diffuses outward from these regions, the process is complex and is far from perfect. Information on new processes seems to spread faster than information on new products which are often jealously guarded by innovating firms. Information also tends to diffuse along well-defined routes. Until more is known about the spatial diffusion of TP, the possibility that regional growth patterns are determined at least in part by regional differences in TP cannot be ruled out (Solow, 1957).

We should expect those regions with low technology to gain productivity improvements by exploiting the technology gap between themselves and high technology regions. This suggests a positive relationship between productivity growth and the technology gap: the

bigger the technology gap, the faster the productivity growth. McCombie (1982) attempted to test the hypothesis using cross-section data for the US states – he found no evidence that each state's technology gap had any effect in its productivity growth.

The assumption that regions produce only one commodity is a fundamental weakness of the one-sector model. *Multi – sector* models imply regions can benefit from comparative advantage. The focus therefore switches to the potential importance of a region's export sector in determining its growth performance (Meade, 1961; Solow, 1970).
This allows us to identify two additional sources of growth.

1. An improvement in the allocation of resources through intersectoral shifts in capital and labour *within* a region;
2. An improvement in the allocation of resources through intersectoral shifts in K and L *between* regions

Several factors can now be seen to contribute to growth in the neo-classical model. The initial stimulus to the region's growth results from an increase in the demand for the region's exports. This leads to higher capital growth in the export sector as a result of greater indigenous investment as well as a net inflow of capital growth in the export sector as a result of greater indigenous investment as well as a net inflow of capital from other regions. In addition, output growth occurs as a consequence of the movement of workers from the low productivity domestic sector to the high-productivity export sector as well as an inflow of workers from other regions.

A crucial difference between the one-sector model and the two-sector model is that whereas the one-sector model predicts that capital and labour will flow in different directions (labour towards high-wage regions and capital towards low wage regions), the two-sector model indicates that *both* labour and capital may flow towards high-wage regions in some circumstances, thus acknowledging a cumulative causation. A further difference between the two models is that the existence of regions with different types of exports increases the possibility of regional difference in TP. To the extent that TP varies

between industries, differences in the industrial base of regions may help to account for regional differences of growth.

Neo-classical growth models offer some insight in to why the output growth varies between regions. The simplistic one-sector model stresses the potential significance of three factors: the growth of the labour force, the growth of the capital stock and technical progress. Moreover, it draws attention to the effect that the interregional mobility of factors of production can have on regional growth disparities (Lewis, 1955). The two-sector model offers a far more realistic explanation of regional growth disparities since it highlights two further, and potentially very important sources of regional growth: movements of factors of production between sectors and the growth stimulus provided by a region's export sector. Interregional growth disparities can therefore be more readily explained once regions are assumed to engage in interregional trade (Chang, 1970).

The neo-classical approach, however, suffers from serious weaknesses. Investors and workers are assumed to be perfectly informed about factor prices in all regions and to respond to any regional differentials by migrating to the region offering the most lucrative rewards. But neither investors nor workers are perfectly informed and there are significant impediments to this market response to factor price differences between regions. Neo-classical models also assume perfect flexibility of factor prices so that interregional movements of capital and labour will automatically remove factor price differences between regions. Factor prices are often far from perfectly flexible in practice, with the result that the neo-classical adjustment mechanism simply fails to operate.

A further fundamental weakness of this approach is its failure to recognise the importance of demand factors of a region's growth. Regions experiencing a rapid growth in the demand for their output will be more attractive locations for investment and this will draw in more capital and labour from other regions. Regions do not therefore face any supply constraints on their growth, provided capital and labour are mobile between regions.

In this work I show how neo-classical theory has played out in reality through neo-liberal policies. This is done by highlighting the approach to the Information Society taken in Europe throughout the greater part of the 1990s and more recently the industrial and economic policies put in place by the Irish government. Through evidence presented in chapter six of the disparities of regional growth in Ireland it has become obvious that there is little mobility of capital, while technical progress in the time of 'tigerish' growth rates was even less mobile. The methodology I apply in appraising these approaches is one of statistical interpretation, which has better aided the evaluation of supply-led initiatives that have placed faith in the workings of the market. A more econometric approach is necessary in evaluating a more economic approach.

Export-led Models of regional development – the Keynesian Approach

The neo-classical approach stresses the influence of basic supply factors such as labour force growth, the growth of the capital stock and technical change. The main critique is that it ignores the potential contribution of factors on the demand-side of the economy. To remedy the weakness, attempts have been made to modify the neo-classical approach by allowing regions to trade with other regions. But once attention is focused on the influence of a region's export sector in determining its output growth, this takes us towards explanation of regional growth disparities, which differ fundamentally, from the neo-classical approach. Some researchers who stress the importance of the export approach have specifically rejected explanations based on the neo-classical model. Thirwall, for example, argues that:

> "Regional growth is demand-determined for the obvious reason that no region's growth rate can be constrained by supply when factors of production are freely mobile...Supply adjusts to demand. We cannot return to the pre-Keynesian view that demand adjusts to supply. If we could, the solution to any region's lagging growth rate would be for it to save more and breed more!" (Thirwall, 1980: 420)

Export base theory, in its more extended form, is somewhat more appealing. It has an advantage over the neo-classical approach in that it stresses the role of demand factors

without ignoring the supply side of the regional economy. Yet it was severely criticised soon after its appearance (most notably Milton Friedman (1980; 1982 and 1987), mainly because, in its simplest form, it merely describes the historic development of regions dependent on raw material exports. It offered little insight into the conditions likely to have a dominant effect on growth. The role of factors internal to a region, for instance, such as local entrepreneurial activity and government development programme, are entirely ignored. While the more naive export-base model is guilty of such omissions, those variants which incorporate induced investment effects, factor supply influences and the effects of external economies of scale are less open to such criticism. Perhaps the greatest weakness of the theory is that beyond the occasional mention of income elasticity of demand, no systematic explanation of the determinants of the demand for a region's exports is attempted, and without this it is impossible to predict regional growth differences. In its simplest form, the model is less rigorous than the neo-classical one.

Regional exports and the process of cumulative causation: a model of regional growth

This model, proposed by Kaldor (1970) was then developed by Dixon and Thirwall (1975). Kaldor argued that regional growth of per capita output is determined by the extent to which regions are able to exploit scale economies and to reap the benefits that accrue from greater specialisation. These benefits vary according to the type of productive activity in which the region specialises, some of which are more susceptible to productivity gains than others. This means that regions specialising in manufacturing are likely to benefit far more from productivity gains than those which rely on land and agricultural production.

The consequence of this sectoral bias is that the benefits to be gained from greater specialisation leads to the prediction that regions specialising in processing activities are likely to grow faster than those specialising in land-based activities. Furthermore, the process is *cumulative* since those regions able to steal a march on other regions will gain

a competitive edge. This will reinforce regional specialisation since the region with the competitive advantage expands its export sector.

Dixon and Thirwall expanded Kaldor's thesis. Their major concern was to construct a rigorous presentation of Kaldor's explanation of regional growth disparities, paying particular attention to the way in which the process of cumulative causation may affect a region's growth. The process of cumulative causation was incorporated into the model by allowing for the feedback of a region's growth on the competitiveness of its export sector. This in turn affects output growth in the region, which has further beneficial effects on productivity and competitiveness in the export sector. This is the process of cumulative causation at work.

Some alternative explanation of cumulative growth

One of the appealing features of the Kaldorian explanation of regional growth disparities is the process of cumulative causation. The Verdoorn[1] relationship is used to incorporate a cumulative growth process in to the essentially export-led model. To the extent that the Verdoorn relationship picks up the influence of economies of scale in generating cumulative growth, it overlaps with the ideas of growth pole theorists such as Perroux (1950), Myrdal (1957) and Hirschman (1958). If an industry is subject to significant internal economies of scale, the firms that grow quickly will gain a competitive advantage over rivals and growth will be cumulative. *Internal* economies of scale, however, play only a minor role in growth-pole explanations of regional growth. A more convincing explanation of cumulative regional growth, and one stressed by Perroux, incorporates the effect of *external* economies of scale.

External economies arise as a result of the spatial proximity of related activities. Two types can be distinguished: localisation economies and agglomeration economies.

[1] Verdoorn (1949) argued that rapid output growth created opportunities for greater division and specialisation of labour. Other contributory factors have also been identified, such as the tendency for technical progress to be stimulated when output grows rapidly. The Verdoorn law therefore encompasses a variety of processes by which output growth triggers productivity gains.

Localisation economies arise as a result of the geographical concentration of plants in the same industry. They include transfer or linkage economies, which occur because of the geographical proximity of plants that have input-output ties with each other. These linkage economies deserve special mention because they reveal some of the reasons why nodal points of transport networks are locations where distribution and assembly costs can be minimised for certain types of industry.

The advantage of proximity allows greater specialisation – which decreases average costs and leads to increased efficiency. But specialisation in production is by no means the only economy of localisation. The geographical association of many plants and firms in the same industry strongly facilitates research and innovation in that industry. It also creates a pool of labour with the required skills upon which all can draw.

Agglomeration economies arise from the geographical association of a large number of economic activities. These may not be in the same industry. They arise because of the concentration of many facilities jointly serving different industries. These include urban transportation and commuting facilities; well-organised labour markets and large pools of workers with different types of skill; the provision of social overheads and government services; and a vast range of legal and commercial services such as lawyers, accountants, consultants and financial institutions. The enhanced attractiveness of existing growth centres creates a whole series of 'backwash' effects, which operate to the detriment of the less developed regions. The efficiency of growth centres as locations for investment makes them a magnet for capital movements. In addition, growth centres tend to drain the less developed regions of their most efficient and most enterprising workers.

At first, the rapidly growing regions may simply bypass the less developed regions and trade predominantly with the rapidly growing regions of other countries. Over time, as interregional trade develops, the less developed regions will gradually be drawn into the market economy, bringing many economic benefits to these regions. There may, of course be costs as well, since the smaller, less efficient firms which had formerly survived by virtue of their isolation, may simply be overwhelmed by the more efficient

industries of the growth centres once interregional trade benefits occur (Armstrong and Taylor, 1993; Dicken, 2003).

In chapters five and six, I look at the development of the Irish economy in the context of cumulative growth theories. Chapter six focuses on the Software industry, in it I look at growth figures in terms of employment, revenues and exports accounted for by the Multinational and indigenous sectors. While the figures are broadly positive on the national level, on the regional level, growth in the industry is rather disparate. The two very separate sectors identified in the industry (multinational and indigenous) lend to an interesting interpretation of linkage economies in Ireland and show that as part of a global production network of the software industry. Here I provide evidence from Ireland that linkages are rarely formed at the local level. Agglomeration economies on the other hand, are prevalent in and around the city region of Dublin. Investigation into the types of operations carried out in the software industry there shows a diverse range of activities undertaken in the city. There is evidence presented that the industry is benefiting from facilities jointly serving the different areas of activity in the city. These facts are presented through the use of a multitude of methods including statistical analysis, background searches on the nature of software firms in Ireland and also the use of more qualitative methods that involved interviews with the industries major players.

Industrial Districts, Flexible Specialisation and Innovative Milieu

In looking at the software industry in Ireland, I will show that Dublin, along with the country's second tier cities have benefited significantly from agglomeration economies. In certain areas of activity I have identified innovative milieu, and the presence of successful software firms within an industrial district can be partly explained by the work of Perroux (1955) and Schumpeter (1934). It is when we take this explanation combined with the flexibility thesis (see below) that we come closer to explaining development of the software sector in Ireland over the 1990s.

There is widespread agreement among economic and social theorists that capitalist economies are undergoing fundamental changes, and these changes are part of the transition to a new era of capitalist development. Although several theories have been put forward to explain these changes, some of the most influential explanations, what is called the "flexibility thesis", have emerged from broad-based frameworks that the shift away from the Fordism is among the most significant development in capitalism today and that address the development of more flexible economic structure. A key element of such explanations of changes has been 'flexibility'.

The flexibility thesis consists of two main theories: one is the flexible specialisation theory, deriving from the work of Piore and Sabel (1984), the other is flexible accumulation theory, deriving from the work of French regulation theorists and the related work of Scott (1988); Storper (1997); Harvey (1996), etc. The flexibility thesis has been largely spread among the urban and regional researchers as well as economic and social theorists, because it contains a middle range perspective, mainly focusing on spatial contexts, relating economic restructuring with spatial restructuring, and suggesting the idea of new industrial districts.

However, it has been followed by a reaction against some of the more categorical claims made concerning the persuasiveness, significance, distinctiveness, ambiguities in the concept of flexibility, the frameworks of binary oppositions and success of the flexibility model, by Bluestone and Harrison (1982); Lovering (1990); Sayer (1986); Amin and Robins (1990), etc. A vibrant debate, the so called 'flexibility debate' has raged in social science in general in the past two decades. Much of this debate was related to the 1980s and in certain terms can be seen as time specific, but by looking at the evolution of this debate we can see how theories influenced not just the policies of the time but can be recognised in present policies. Another reason for doing so is that we can better appreciate their different interpretations on the supra-national level of the EU and the national level of Ireland over that period of time.

Historical grounding

Mainstream classical economics made little of industrial organisation or the relational aspects of inter-firm linkages apart from suspecting them of being in restraint of trade. Coase explained the reason for this: economists think 'of the economic system as being co-ordinated by the price mechanism' (1937. 387) and having regard to the fact that if production is regulated by price movements production would be carried out without any organisations at all.

In Marshall's work, however, organisation and knowledge are central to the evolutionary trajectory of capitalism. He argued:

> "Capital consists in a great part of knowledge and organisation... Knowledge is our most powerful engine of production; it enables us to subdue Nature and force her [*sic*] to satisfy our wants. Organisation aids knowledge; it has many forms, e.g. that of several businesses in the same trade, that of various trades relatively to one another, and that of the state providing security to all and help for many. The distinction between public and private property in knowledge and organisation is of great and growing importance: in some respects of more importance than between public and private property in material things; and partly for that reason it seems best sometimes to reckon Organisation apart as a distinct agent of production" (Marshall, 1952 p.115)

Individualistic initiative and free enterprise are therefore the central driving force of economic progress in Marshall, for whom, the importance of the localisation of production within industrial districts is that it creates an environment more favourable to individual success. These positive external economies to individual firms stem, fundamentally, from their geographical proximity.

Real progress in developing a dynamic theory of regional growth came about in the 1950s, when economists on both sides of the Atlantic more or less simultaneously hit upon the fruitful association between Joseph Schumpeter's earlier economic writing on

innovation (1934) and the idea that dynamically growing places are the locales of innovative firms and industries. The most comprehensive statement of this association was contributed by the French economist Perroux (1955).

For Perroux, what lifts the economy out of the stationary state is Schumpeterian innovation. Industries making old and new products will, on average, be expected to grow at different rates. These differential trajectories will in turn affect other firms and industries, initially through 'backward and forward linkages' at prevailing relative prices and, over the long run, through changes in relative prices and in investor's expectations (Cooke and Morgan, 1998).

What makes Perroux's contribution stand out is his distinguishing between *firme ou industrie motrice* – a qualitative concept referring to leading firms with generally strong backward and forward linkages – and *firme ou industrie clef* – key firms or industries whose downstream growth impacts actually exceed the initial expenditure (implying, in input-output terms, a multiplier greater than one).

About five years later, a series of monographs on the New York Metropolitan Region Study were being published (see Hoover and Vernon, 1959). In these, Schumpeterian thinking (together with a protean version of what would later become 'information theory') constituted the common denominator, in the form of 'product cycle theory'. The theory of the product cycle posits that the innovation process passes through conceptually distinct stages, from early experimentation to diffusion and ultimately maturity. In the early stages, firms tend to be small, work is often organised in a craft mode, specialised skills are especially needed and intense face-to-face interactions are absolutely essential since an important part of the innovation process involves the rapid exploitation of unexpected exchanges of ideas (Harrison, 1992; Dicken, 1998).

As production techniques became easier to standardise, and the most competitively successful products find more expansive markets elsewhere, exporting from within the established agglomeration becomes less attractive. As the more 'mature' activities migrate, new innovative products and processes are born into the old growth pole and go through the development cycles themselves. The healthiest growth poles are defined as

those which prove capable of continually regenerating themselves through this process by institutionalising the capacity to serve as seedbeds to newly innovative economic activity.

Eventually, a reaction set in against strict product cycle thinking. For example, building on Galbraith's (1967) model of the large modern corporation capable of engaging in strategic planning, Markusen (1985) argued that powerful oligopolies have financial and strategic capability to effectively short-circuit the 'maturation' stage, with its eventual exhaustion of Schumpeterian rents by recycling resources, differentiating products and relocating phases of their operations to more profitable sites.

A very different sort of critique of product cycle theory was simultaneously being developed in MIT. For Piore and Sabel (1984), it is industrial districts that are of the utmost importance to regional development. Along with Scott and Storper (1989) they have grounded their valuation of industrial districts in an analysis of broader macroeconomic and macrosocial transformations of that period. The work of Piore and Sabel is predicated on the idea of a radical shift from a model of industrial development founded on mass production to a probable coming of era or regime of flexible specialisation based on flexible technologies, skilled workers, and new forms of industrial community. The second industrial divide is characterised by a transition from one technological paradigm to another.

The economic geography of Scott and Storper mobilises the regulationist concepts of 'regime of accumulation' and 'mode of regulation' to argue that the present historical rupture marks the crisis of Fordism as both model of accumulation and regulation.

Flexible specialisation and industrial districts

Piore and Sabel (1984) argued that flexible specialisation is a consequence of a crisis of mass production: mass markets were said to have become saturated and consumers were now demanding specialised and differentiated goods to which the mass production system could not respond. In the new unstable and uncertain environment where:

> "markets can no longer be effectively managed and controlled it is important for organisations to be able to respond flexibly to market conditions and change..." (Piore and Sable, ibid: 162)

Having asserted the centrality of flexible specialisation as a new social paradigm, they then go on to suggest that this has particular spatial implications. The relation between the economy and territory is changing:

> "The more volatile markets become, the more firms experimented with flexible forms of organisation which permitted rapid shifts in output. As they did, they encouraged the reconsolidation of the region as an integrated unit of production" (Sabel, 1989: 18)

The reasons to this new territorial logic are hard to adduce. Piore and Sabel seem to assume that it is necessary to a regime of flexible specialisation. According to Amin (1994) their account is more descriptive than analytical.

Sabel (1989) emphasises the importance of industrial and social networks, pointing to the learning advantages of network systems as industrial organisation. Such networks he argues are crucial to those that are imitating and allying with the industrial districts. Having described the combined logic of economic, social, and spatial development, Sabel goes on to advertise the transformative potential of the new industrial districts and to emphasise the potential for endogenous development by flexible regional economies.

> "If the pooling of knowledge succeeds, it can easily become the political metaphor and matrix for the pooling of other resources as well. The more knowledge available to each industrial district, the more likely that each can draw on the resources of the others in its moments of distress" (Sabel, 1989:58)

Amin and Robbins (1990) openly contest the above claims, firstly they claim the structural transformation, namely the break-up of mass markets, upon which the entire theory is constructed, is a dubious one. The second area of difficulty concerns the nature of the explanation of restructuring across the second industrial divide. There exists strong contrary tendencies in their thinking that push the analysis towards a behaviourist logic. They go on to claim that what we have then is a complex theoretical syncretism, and

unholy alliance of the ideas of Piore and Sabel, the economic geography of Scott and Storper, regulation theory, and the neo-Schumpeterian long wave theory. Although there are clear differences in the components, what tend to be emphasised are the apparent convergences and commonalties and while the notion of 'technological paradigms' is much invoked, there is no acknowledgement that it means quite different things to Piore and Sabel than it does in long-wave theory. Similarly, concepts of crisis and historical rupture are used very loosely and vaguely, as are notions of historical phases or stages. There is, for example, an unsubstantiated assumption that regimes of accumulation correspond to Krondratieff cycles. There is a great deal of confusion about the object of analysis: at times it is labour process or industrial organisation, whereas at other times it is the macro economy or even society as a whole (Amin and Robbins, 1990). What is being alluded to here is one of the strongest critiques of this school of thought: its fuzzy conceptualisation. There is an obvious lack of pinning down definitions, thus leaving notions central to the school of thought open to various interpretations by the reader (Markusen, 1999). The methods that I have employed bring about a greater degree of clarity in how I critique the effects of these theories across Ireland and Europe. Employing statistical aids along with maps and clearer definitions of ideas central to these and other theories in both interviews and surveys has helped me accomplish this.

The rationale for the growth of flexible specialisation is built around the strategic considerations of social actors and their tactics in particular instances; around such variables as trust, solidarity, community allegiance, local pride. To some extent this psychological framework reflects Piore and Sabel's desire to avoid technological or economic determinism and to maintain a sense of openness and possibility. The atomistic and individualistic framework of behaviourist theory cannot be combined or reconciled with a broader perspective on structural and political transformation. Piore and Sabel's approach remains an unsatisfactory blend of determinism and voluntarism. In the course of outlining the development approach both Ireland and the EU have taken over the past number of decades I highlight particular instances where both have pursued policies inspired by the theories of Piore and Sabel, which have in fact fallen foul of the

determinacy that their critics describe. The end result of which has been a reinstatement of the unequal spatial development across both Ireland and the EU.

Vertical Disintegration and new production complexes

Beginning from the analyses of the Regulation School, Scott and Storper (1989) described that period as one in which the crisis of Fordism as a regime of capitalist accumulation is now leading to the emergence of a new regime of flexible accumulation. In the late 1970s, they argued, the Fordist model of industrialisation was in disarray: new emerging structures of flexible production helped to intensify the crisis of Fordism by exerting strong competitive pressures on mass production industries, whilst, at the same time, the advent of flexible production organisation was encouraged by the problems of Fordist industry. As with Piore and Sabel, we again see a simple binary opposition between mass production and flexibility underpinning the logic of economic transformation. In the aftermath of Fordist mass production we see 'flexible production methods' and ensembles of flexible production sectors come to the fore.

Scott and Storper offer a very neat account of the proliferation of industrial districts; intensifying flexibility results in the vertical disintegration of organisational structures, which in turn leads to locational convergence and spatial agglomeration. On this basis, we can differentiate the late-fordist regime of accumulation, characterised by branch plants and the decentralisation of production to peripheral regions, from its successor regime, with its strong agglomerative tendencies in flexible production sectors and its 'reaffirmation of the significance of place as the foundation for efficient and effective production apparatuses'. In the transition from Fordism to flexibility, a functional logic of organisational structure gives way to a new territorial logic. This is a more coherent and systematic rationale for the centrality and importance of industrial districts than that offered by Piore and Sabel, based as it is on the necessary logic of the restructuring process, rather than on the relative contingency of behavioural dynamics.

Neat and coherent, but for Amin (1994) and Lovering (1999) it is too neat and coherent. They see the real world as more complex and chaotic than the above schema. Although Scott and Storper have a more nuanced and sober position, they are in the end caught up, like Piore and Sabel, in the idealisation of flexible specialisation and industrial districts and the demonisation of Fordism and mass production. Reality is more ambiguous and more obscure than that. As Sayer argues, we should not assume that mass production and flexible production are contrasting alternatives. 'Capitalist industry' as he points out, 'has always combined flexibilities and inflexibilities and what are possibly emerging now are new permutations of each other rather than a simple trend towards greater flexibility, period' (Sayer, 1990: 671 in Amin and Robins 1990).

Scott and Storper (1989) are also guilty of collapsing together such heterogeneous developments as Italian industrial districts, high-technology growth centres, and metropolitan business agglomerations into one master paradigm. The consequence, as the gap opens between model and reality, is an abrupt contrast between the old and new orders: "the old industrial spaces of the Fordist regime and the new spaces of flexible accumulation, in their purest and sharpest expression, contrast starkly with one another" (ibid:171)

Flexible specialisation and flexible localities are significant for Scott and Storper in the context of broader sociohistorical processes. Amin, Robins and Lovering, argue that they misunderstand the nature of those processes, and that it is a misunderstanding that is rooted in a theoretical framework characterised by structural-functionalism and historical teleologism. Certain tendencies in the present period are absolutised, and then projected forward as the paradigm for a future regime of accumulation, for a new historical phase of capitalism; and then it is in the light of this reified, ideal type model of post-Fordism that the events of the present period are assessed and explained (Lovering, 1999). The historical trajectory to a post-Fordist society is a determined and inexorable process, one that is rooted in the logic of capital itself. The view of the critics is that the process is far less determinate than is suggested by the new orthodoxy. As more careful and nuanced research within the regulation perspective makes clear, the resolution of the present crisis could take many different forms. The crisis, for example, could take a very long time to

be rescaled, or it might even provoke catastrophic regressions. The re-emergence of regional economies is not simply and unequivocally written into the schema of things beyond Fordism. How this has played out in Ireland will be the focus of chapters five and six. Through the use of maps and interviews we begin to see the importance that has been placed on industrial districts by the Irish government in an attempt to foster the development of new industries. What becomes increasingly obvious in the lack of spatial uniformity in their development, and how the Irish software sector is essentially only made up of two or three significant clusters of activity.

Clustering and Geographical Economies

The development of the clustering of innovative activities has become increasingly apparent in the past few years. This clustering, first recognised by Schumpeter, has been interpreted in different ways. Sometimes the focus is on the generation of groups of highly inter-related products where, for example, each develops from and/or contributes to the development of others. As Debresson (1989), for example, has pointed out in discussion of the Canadian snowmobile development, much of the dynamic effect of innovation may come through this clustering rather than through the intrinsic value of a single innovation.

The reasons for this clustering are in part technical and in part organisational. While admitting Schumpeter's recognition that innovation does not require invention but is essentially a new way of combining existing elements, Debresson concludes nonetheless that the opening up of new technological frontiers does affect the rate and directions of opportunities for innovation. Innovations in economic terms (involving exceptional profits), Debresson believes usually arise from the interaction of paradigmatic discontinuities in technology, from technical systems of complements and from cumulative learning processes. The cumulative nature of technical know-how encourages economies of scope through the transferability of learning benefits which enable inputs to new products, notably at plant level.

At an organisational level, the innovation process usually involves interaction between the user (innovator) and one or more suppliers (producers): this interaction involves transaction costs but these reduce dramatically with time and a longer-term productive relationship may produce further innovations, as the Japanese productive model has indicated, thus again increasing clustering. This clustering may cross industry lines and in some areas has been successfully fostered by government. This approach thus focuses attention on innovation through the development of inter-related products, each building on each other.

A broader analysis of clusters in the national innovation process is provided by Porter (1990). The question Porter wishes to answer is why only certain countries generate many companies which become successful international competitors in one or more industries. The analytical lens used by Porter brings into focus the individual company and its place in the structure of a particular cluster of firms in the same industry. Competitive pressure and the associated continuous innovation provide the dynamic of the advantage which companies in this virtuous circle derive. In this analysis, then, it is the companies, and the relationships of competition and collaboration between companies in a similar market segment, which are the key to the competitive advantage not just of one leading firm but also of all or most of the firms in the area. The unit of analysis is thus the industry, but Porter points out that most successful national industries comprise groups of firms, not isolated participants, and that most leading international competitors are in the same city or region.

Basing his analysis on ten cases in ten countries, Porter suggests that the competitive advantage of these continuously innovating firms in each area derives from their position within national configuration of four sets of factors which he conceptualises as a 'diamond'. These are:

1. Factor conditions – the nation's position in factors of production such as skilled labour, capital stock, knowledge resources or infrastructure.
2. Demand conditions – the nature of *home* demand in particular for a product or service.

3. Related and supporting industries – the presence of suitable suppliers and related industries that are also internationally competitive.
4. Firm strategy, structure and rivalry – the conditions governing how companies are created, organised and managed and the nature (intensity) of domestic rivalry.

When all the elements of the 'diamond' are functioning satisfactorily the outcome is not one but a cluster of successful firms operating within and between given industries. These firms are mutually supporting. As Porter says,

> "Benefits flow forward, backward and horizontally. Aggressive rivalry in one industry tends to spread to others in the cluster, through the exercise of bargaining power, spin-offs and related diversification. Entry from other industries within the cluster spurs upgrading by stimulating diversity in R&D approaches ...Information flows freely and innovations diffuse rapidly through the conduits of suppliers or customers...Interconnections within the cluster lead to new ways of competing and entirely new opportunities" (1990: 151)

Porter's analysis only incidentally mentions the likely geographic propinquity of the successful clusters and says little about the size of the firm involved. This stands in sharp contrast to the notion of industrial district first developed by Marshall (1920) and since much analysed by writers rediscovering the industrial districts of Italy, Germany, Japan etc.

Porter's Clusters: A Chaotic Concept?

As will hopefully become clear from the later section on policy (pg.54), the above theory has had huge policy implications in Europe and not least in Ireland. Porter's ideas have been most significant, in his highlighting of clusters as the quickest path to regional development. However, in more recent times this has come in for quite a bit of

questioning, and with it so too has the whole concept of milieu and the ability to reap economies of scale.

Some academics, not least Martin (2001), have begun to question what exactly, this literature means by cluster. Martin quite rightly highlights that the term is highly generic, and deliberately vague. Strong linkages and 'geographical proximity' are never really defined, we are not told how 'strong' or at what 'scale'. What is missing from this 'highly generalised theory' is something that situates cluster development within the dynamics and the evolution of industry and innovation more generally. Martin highlights the selective empirics in the cluster creation game, that they are constructs with no natural boundaries, making them impossible to map, and their identification extremely ad hoc. Martin also avers that cluster policy as pursued is extremely prescriptive with little or no attention given to the potential disadvantages such as:

- Inflation – both of land prices and cost of living;
- Technological isomorphism (inward looking);
- The existence of a dual economy;
- Over specialisation and institutional lock-in.

We are seeing a re-evaluation of the promotion of cluster policy in light of these criticisms, this recognition in theory is in the process of shifting to the policy arena. In terms of Ireland's approach to spatial development, the most recent policy document, the National Spatial Strategy (2002) has highlighted many of the disadvantages that are now being experienced in Ireland's bigger cities. In chapter 7 I look at Ireland's approach to regional development over the history of the State and question the implications of pursuit of what is essentially a 'growth pole' approach in the early twenty-first century.

Institutional Thickness, Networking, and Social Capital in the Knowledge Economy

As will be seen in later chapters, much of the theory covered so far, has had the greatest deal of influence on national policy making in Ireland. Evidence from chapters five through seven highlight how the regional policy stance in Ireland has evolved from the more neo-liberal to the more incentive based industrial districts through the auspices of the Industrial Development Authority (IDA) and the government. Until recently, regional economic development policy across the developed world has largely been firm-centred, incentive-based, state-driven and standardised. The common assumption is that top-down policies can be taken off the shelf and applied universally to all types of region, since at the heart of economic success lie a set of common factors (Amin and Thrift, 1995)

The achievements of what can be described as the 'imperative' approach (Hausner, 1995), have been modest in terms of stimulating sustained improvements in the economic competitiveness of the Less Favoured Regions (LFRs). Keyensianism did lead to increased employment and income, but did not succeed in encouraging self-sustaining growth. The 'market therapy' has threatened a far worse outcome, by removing financial and income transfers which have proven to be vital for social survival, by exposing the weak economic base of the LFRs to the chill wind of ever enlarging free market zones, while also failing singularly to reverse the flow of all factor inputs away from the LFRs.

In this section I wish to highlight theory that has bought about a paradigmatic shift in policy making. This has generally been referred to as the 'institutional turn' in regional development studies. This is a conceptual shift focusing on relational assets which has been triggered in part by growing dissatisfaction with neo-liberalism and the classical development repertoires which sought to privilege market-driven processes regardless of time and space. The institutional perspective echoes the 'state' and 'market' in favour of a more historically-attuned theoretical approach in which the key issues are the quality of

the institutional networks in control of information exchange and knowledge-creation, the capacity for collective action, the potential for interactive learning and the effectiveness of voice mechanisms (see Amin and Thrift, 1995;and Cooke and Morgan, 1998).

To avoid confusion it is worth saying that the institutional perspective does in no way disregard states and markets in its analytical framework in favour of networks of association. It actually claims that networks have the potential to make both states and markets more effective. In the case of the state by creating a more dynamic policy environment with which it can engage, and in the case of the market by rendering it less of a Hobbesian war of all against all in which firms are inclined towards opportunistic behaviour. For all their differences the classical repertoires of dirigisme and neo-liberalism are paradoxically at one in devaluing the significance of that panoply of intermediary institutions between 'state' and 'market', such as inter-firm networks, trade associations, chambers of commerce, regional development agencies and the like. Ordinary as they might seem, these self-organised intermediary institutions have the potential to play a significant role in fostering learning, innovation and development among their respective members and within their respective regions because, taken together, they constitute the institutional basis for collective action.

The following chapter deals with the approach to the information society and regional development at the European level. What is most interesting is how quick policy makers in Brussels have adapted to this relatively recent turn in developmental thinking. The chapter traces the evolution of policy making in the European Union over the course of the 1980s and 1990s, and pays particular attention to the change from more neo-liberal, supply-led initiatives in the early 1990s to the more institutionalist programmes of the late 1990s. One of the main vehicles of analysis is the Regional Information Society Initiative (RISI), to which chapter four is dedicated. I use this initiative to demonstrate the shift in theory and how that has translated into reality. In analysing this shift I employ both my quantitative and qualitative methodologies in an attempt to gauge the success of the programme, which is very much dedicated to a bottom-up approach that places a

great deal of emphasis on learning and collaborative networks to enable less favoured regions (LFRs) to become part of the information society.

It goes without saying, perhaps, that core regions of the world economy are well-endowed with robust interactive learning networks, since this is one of the reasons why they became core regions in the first place. What is much more open to question, however, is whether LFRs are able to craft such networks to promote endogenous learning, innovation and development. It is not that LFRs are without networks, but that these tend to be of a predominantly vertical and asymmetrical character, which render local institutions highly dependent upon state or corporate hierarchies, in contrast to the more dynamic, horizontal networks which tend to form around agents of broadly equivalent status and power (Amin, 1999; Morgan and Nauwelaers, 1999). That vertical networks are less helpful than horizontal networks in solving dilemmas of collective action and promoting localised learning is because:

> "A vertical network, no matter how dense and no matter how important to its participants, cannot sustain social trust and co-operation. Vertical flows of information are often less reliable than horizontal flows, in part because the subordinate husbands information as a hedge against exploitation. More important, sanctions that support norms of reciprocity against the threat of opportunism are less likely to be imposed upwards and less likely to be acceded to, if imposed...In the vertical patron-client relationship, characterised by dependence instead of mutuality, opportunism is more likely on the part of both patron (exploitation) and client (shirking)" (Putnam, 1993:174).

In contrast to the classical repertoires of dirigisme and neo-liberalism, which have little or nothing to say about trust, voice and reciprocity – relational assets which lubricate successful networks - the institutional perspective insists that these intangible resources merit as much attention as tangible resources (Cooke and Morgan, 1998).

Trust, Voice and Loyalty

All three of these concepts come under the broader umbrella of social capital (Putnam, 1993). I would like to deal with these briefly in an attempt to make explicit these 'intangible' facets seen as fundamental to the institutional turn in regional development. Trust is the confidence that parties will work for mutual gain and refrain from opportunistic behaviour, and is being realised as one of the most important economic assets if it can be secured. Its intangibility lies in the fact that, unlike other economic assets it cannot be bought; rather it has to be earned by discharging one's obligations or by eschewing opportunities to exploit short-term advantages. Trust comes in two guises, low and high, the former being closer to opportunistic behaviour which is assumed to be prevalent in transaction cost economic theory. On the other hand high-trust is said to confer the following benefits on participants:

1. They are able to economise on time and effort because it is extremely efficient to be able to rely on the word of one's partner;
2. They are better placed to cope with uncertainty because, while it does not eliminate risk, trust reduces risk and discloses possibilities for action which would have been unattractive otherwise; and
3. They have a greater capacity for learning because they are party to thicker and richer information flows (Sabel, 1994; Sako and Helper, 1996; Cooke and Morgan, 1998; Morgan, 2001).

Contemporary theories of learning, innovation and development continue to grapple with the problems identified by Hirschman (1970), particularly the problem of voice-formation. Other examples would be Sabel's work on 'learning by monitoring', which highlights the role of discussion as the process through which "parties come to reinterpret themselves and their relation to each other by elaborating a common understanding of the world" (Sabel, 1994: 59). Then there is Piore's hermeneutic perspective, where the problems of orchestration and co-operation are likened to a series of intersecting conversations in which the key issues are who talks to whom and what they talk about (Piore, 1995). Finally, Storper has emphasised the significance of 'soft' factors, like talk

and confidence, in building the relationships of the institutionalised learning economy (Storper, 1997). Storper tentatively suggests that, under certain conditions, talk and confidence are 'more likely to succeed when they are geographically localised' and that small, repeated and low cost experiments can help to induce interactive learning between parties in an environment which has hitherto been characterised by distrust or antipathy (Storper, 1997). These issues lie at the heart of the regional innovation experiments which are taking place in Europe today, and these carry implications far beyond the confines of the regions directly involved in this process of experimentation (Sabel, 1995; Cooke and Morgan, 1998 in Morgan, 2001).

Differentiating the Institutional

The rediscovery of institutionalism has drawn in part on renewed interest in endogenous growth theory which, acknowledges externalities and increasing returns to scale associated with spatial clustering and specialisation (Krugman (1997), Porter (1990)). These include reduced transaction cost, scale economies of agglomeration, and technological or skill advantages associated with specialisation. The contention of Krugman and Porter (against their neo-classical colleagues) is that external economies, skilled labour and technological innovation are spatially clustered, and that such clustering offers some of the key elements of growth and competitiveness. The appeal provides some solid economic reasons for local agglomeration in a globalising economy.

However, this new economic geography fails to investigate properly the sources of these economies, which according to a second strand of regional rediscovery developed largely by geographers, lie in the character of locally embedded social, cultural and institutional arrangements. Here, insight is drawn from institutional and evolutionary economics concerning ties of proximity and association as a source of knowledge and learning. Storper (1997) talks of localisaton of economic activities being the strength of their 'relational assets' or 'untraded interdependencies'. These include local tacit knowledge and face-to-face exchange, the quality of local institutions, long standing social habits and norms, local conventions of communication and interaction, etc.

It is claimed that these informally constituted knowledge and information environments allow firms to engage in learning-based competitiveness owing to their daily access to the relevant resources (information, knowledge, technology) through networks of inter-dependency, formal institutions of learning, and common understandings that surround individual firms. Many of the insights of the institutionalist literature on so called learning regions (Morgan, 1997) such as Silicon Valley, Baden-Wuttenberg, and the Italian industrial districts derive from analysis of the comparative advantages of local business networks specialising in individual industries. Through specialisation these regions display high levels of inter-firm interaction, shared know-how, spill-over expertise, and strong enterprise support systems.

Storper and others have suggested that proximity plays a unique role in supplying informally-constituted assets. For instance, Maskell and Malmberg (1999) have argued that tacit forms of information and knowledge are better consolidated through face-to-face contact, not only due to the transactional advantages of proximity, but also because of their dependence upon a high degree of mutual trust and understanding, often constructed around shared values and cultures. Similarly, Becattini and Rullani (1996) have distinguished between codified knowledge as a feature of trans-local networks (e.g. R&D laboratories or training courses of large corporations) and formally constituted institutions (e.g. business journals) and non-codified knowledge (e.g. workplace skills and practical conventions) as aspects locked into the 'industrial atmosphere' of individual places.

The institutionalist geographers take the role of proximity to be much wider than that theorised by the neo-classical strand, which stresses well known but weary factors associated with the economics of agglomerations. Notwithstanding their differences, the consensus shared across both these strands is that regional-level industrial configurations, supply-side characteristics and institutional arrangements, can play a critical role in securing economic success in a globalising economy characterised by transnational flows of factor inputs and global-level industrial and financial organisation.

As we shall see below, more and more policy makers are taking note of the institutional turn in regional studies. We are witnessing a paradigm shift where we are beginning to see the institutional approach replace the reigning orthodoxy. I use RISI as evidence of this shift in action where I show institutional theories become a reality through policies put in place. What also has become obvious in the new turn is the scale on which these policies are enacted. Owing to the local-level approach implied by these theories we are beginning to see recognition of the region as the most important scale to capitalise on knowledge flows in the information age. In later chapters I show how this has been recognised in Brussels and also put forward some evidence of it trickling down to the regional level across Europe. Examples of this are seen in the Irish regions I have used for my case study, interview and survey work show that both RISI and non-RISI Irish regional actors are very much aware of the new turn in regional thinking, an interesting point being that this knowledge has filtered down from the European and not the national level. The next section will focus on policy development in the Information Age, and highlights the complementary nature of an institutionalist approach in the information age.

The Institutional Turn: Developing the region in Information Age Europe

As we have seen, this approach is heavily influenced by the institutional theories of the 'third way' between the market and the State. Unlike previous EU regional development programmes, which were inordinately biased towards supply-side initiatives, the new generation of regional innovation policies (like RISI and RIS - Regional Innovation Strategy) represents a radical departure in two ways: first, they address themselves to the demand-side problems of local firms and, second, they aim to tackle the problems of institutional inertia in the LFRs by sponsoring a new, consensus-based process of interactive learning within and between the public and private sectors (Morgan, 1997). Elsewhere it has been argued that these new regional innovation policies signal a serious attempt, on the part of policy-makers and practitioners alike, to address the problems

which have been identified in the institutional perspective on regional development (Morgan and Nauwelaers, 1999). In particular these new policies seek to engage with the most obdurate institutional problems (like voice-formation, co-operation and collective action) which have been exercised by a long line of developmental theorists from Albert Hirschman onwards.

The emphasis placed on innovation and learning in institutionalist theory makes it a perfect forerunner for theories that have inspired recent EU policies on development in the Information Age. Chapter 3 shows that as learning and knowledge have been increasingly recognised by policy makers as the key to regional economic success, there has been a proliferation of innovation and information age policies emanating from Brussels to promote these key drivers. The notion of an Information Age itself, started to appear in accounts of contemporary society in the early 1960s, and until the 1980s claims made about the information revolution were subject to extensive interrogation. However, in the most recent rush to identify the (imminent) arrival of the global information society, criticism has been much more muted. Early analyses of the information society, from Fritz Malchup's groundbreaking study in 1962 of *The Production and Distribution of Knowledge in the United States* to Marc Porat's work on *The Information Economy* in the mid-1970s, focused on the United States. Only after 1976 did studies start to appear which looked outside America (Poirier 1990: 247-9). And while in the early 1990s interest seemed to be on the wane, the emergence of the Internet as an increasingly mass medium has prompted a major expansion of interest in the information society.

May (2002) identifies different periods of analysis of the Information Society, considering the relatively recent focus on the potential of the internet and the widespread interest in the Information Age as a period of its own. The work of Malchup, Porat and Bell fits into an earlier period of analysis, with Bell for instance, recognising that knowledge had always been necessary in the functioning of society, but what would be distinctive about the post-industrial society is the change in the character of knowledge itself. What has become decisive for the organisation of decisions and the direction of change is the centrality of theoretical- knowledge - "the primacy of theory over

empiricism and the codification of knowledge into abstract systems of symbols that . . . can be used to illuminate many different and varied areas of experience". (Bell 1974: 21)

As will be made obvious in later chapters there has been a great deal of hype surrounding the emergence of the information age. In an attempt to combat this Chapter 8 goes to greater lengths to place more tangible definitions to development by segregating the information economy from the information society. Chapter 4 also highlights the evolution of policies dedicated to promoting development in the information age. A significant part of this involves looking at the innovation theory/policy from whence the more recent information society (IS) policies came. The chapter also critiques some of the earlier EU IS programmes for placing too much emphasis on the market. The neo-liberal theory discussed earlier in this chapter drove these mechanistic policies which were spurred on by the high degree of technological determinism in the early 1990s.

Those who proclaim that the development and deployment of new ICTs have produced profound changes in society start from the premise that technological changes bring in their wake major shifts in the societies which use them. Indeed, to argue that ICTs are producing a new age requires this assumption, otherwise it would make little sense to place such explanations weight on ICTs. The use of information and knowledge is as old as society itself. Therefore, even analyses which explicitly focus on the changes in the uses and/or types of information (and knowledge) that pattern society still assume it is new information technologies which allow the new uses to be identified as transformative. This position implies that our previous history was also determined by the development of technology: no one has argued (as far as I am aware) that ICTs are the first technologies ever to produce a major impact on the history of society. The argument for the emergence of the information society therefore also involves a general claim about historical processes.

By taking changes in technology as the most important single factor in explaining any particular change in society, technological determinists deny (or ignore) the role of social and political choice, obscuring the social embeddedness of technology. This is not an

unusual or novel view; Frank Webster has concluded that 'for those who assert that we are witnessing the emergence of an "information society", high on their list of shared principles is technological determinism' (1995: 219). Technological determinists tend to think (to varying degrees) that technological advances happen automatically, that there is a logic to technological developments which is outside our control.

As has already been pointed out in earlier chapters deterministic thinking is rarely of any benefit. Indeed, it is recognised that this way of thinking can be directly correlated to bad public decision making leading to bad policy measures. Scepticism about the information society is on the increase, plenty of works including May (2000), Haywood (1998), Holderness (1998), to name but a few have begun to unearth a chasm that exists in the new digital age, that of the cyberspace divide.

This is reinforced by the fact that social divisions and distinction have remained largely untouched by the massification of a whole range of computer-based technologies, and the Internet will be no different. It owes its existence to the desire of info-rich actors to talk and share information and knowledge with other info-rich actors, and whatever their altruistic motives may or may not be, neither will have the power (though some may have the desire) to extend membership of the club. Contrary to current Internet folklore, the users do not own the 'means' (Haywood, 1998). In looking at the development of the Information Age region in Chapter 8 I highlight the unequal spatial and social nature of development in the new era with particular reference to Irish regions.

The main body of this work highlights the fact that while the Information Age may open up opportunities for some LFRs to benefit from the increased mobility of routinised and codified work, there are equally clear limits to these opportunities. Some regions, in particular those that can offer a large, differentiated and under-utilised labour force at low costs, and which have a reasonably well developed basic transport and other infrastructure, have the most to gain. It is equally clear, however, that there are threats from concentration of services activity in some regions that can denude other regions of important service functions and employment. Some of these operations could be moved

to lower cost regions beyond the boundaries of the EU; and some of the functions currently undertaken in 'customer service factories' could be substantially automated in the future.

As will become clear from work carried out on Ireland in chapters six and seven, relying on externally determined location decisions, may provide a short term fix to some of the problems of unemployment or underemployment in LFRs, but it does not provide the basis for a robust regional economy in the long run. There is little evidence that this is a widespread or systematic development in LFRs. If anything, the reverse is true; that the take-up of new technologies is generally lower in LFRs.

As has been recognised by leading writers in the institutional turn, the key regional requirement is not 'information' (codified data) but knowledge, and in particular tacit knowledge, the kind that is resistant to being transformed into information. One way of approaching this task is by the promotion of a continuous process of 'learning' within the regional economy – a 'learning region' strategy (Cornford, 2001). The concept of the learning region is often little more than a trite application of some fashionable business doctrines into regional development discourse (e.g. Florida, 1995). Writers like Lundvall (1996), Lundvall and Johnson (1994) along with Storper (1995) see the learning regions as more to do with *institutional* learning within the regional economy. Cornford, Gillespie and Richardson (2000) go further by saying that it is the robustness of the social networks within the regional economy that determines the successful adaptation of computer networks.

Table 2.1 Regional Development in the Information Age

Social Characterisation	Regional Model	Findings	LFR policy	Critique
Wired Society	Connected/Wired region	Bi-directional positive relationships between telecoms and R&D, liberalisation favouring core regions	e.g. telecoms infrastructure investment	Excessive supply side orientation
Information Society	Information intensive region (relocation of 'information intensive work' and use by indigenous firms to network together or reach extra-regional market)	Some relocation of lower value service work to LFRs, high value added retained in the core, indigenous firms lack capacity and credibility	e.g. demand stimulation: attraction of back offices and call centres, teleworking; interfirm networks	Undifferentiated notion of information; and failure to pay attention to significance of tacit knowledge and firm competence.
Knowledge-driven Economy	Learning region (use of various kinds of knowledge within and between organisations; tacit knowledge, learning, hybridity of face-to-face and ICT-mediated communication.	Reinforces the weakness of LFRs; Difficult and expensive to effectively operationalise	Life-long learning; enhanced role for universities and colleges	?

(Source: Cornford 2001: 2)

The above table shows the approach by the EU to developing the IS in European regions. The shading of each approach signifies policy's connection to the theories outlined in the previous section.

The lighter grey section in table 2.1 is demonstrative of the more market-led approach of the early 1990s, much of which in the EU was carried out under telecommunications policies in the mid 1990s. Its supply-side orientation was justified in the publication of European Commission documents. Liberalisation has been interacting with technological change and the diversification of services to shape the uneven geography of telecommunications service supply (Conford, O'Siochru and Gillespie, 1996), and was soon recognised as a key area of the EU Information Society programme. Although liberalisation can be expected to increase overall investment, that investment will be highly unevenly distributed. As has become all too clear in Europe, the provision of services under the auspices of the free market has bought with it a bias in favour of the more populated/prosperous regions of the Union.

In maximising profit/revenues from the most profitable markets, services are primarily targeted or used by large businesses such as leased lines, virtual private networks, long distance and international telephony, intelligent network functionality, etc. Commercial pressures ensure that established operators are forced to reflect this strategy if they are to meet that competition (see Beesley and Laidlaw, 1995)

In response, the Commission put measures in place to create a more uniform telecommunications provision. The response was very much supply-led in orientation whereby action was taken to build infrastructure in the more remote regions ahead of demand. A critique of these infrastructure-led policies, such as STAR (see chapter three) emerged and pointed out that there is little point in putting infrastructure in ahead of demand if there are no users sophisticated enough to make use of it. As Parker and Hudson pointed out, regional development 'depends critically on how well individuals, businesses and communities use telecommunications networks to improve their economic

prospects' (1995: 161). The effectiveness of this critique may be gauged by the most recent advice from the Commission which effectively bans the use of ERDF funding for telecommunications infrastructure, in favour of demand-side interventions (CEC, 1999). The emphasis then turns to attraction of information-intensive inward investment from the service sector and attempts to stimulate the indigenous demand-side to make fuller and better use of ICT, either to form regional networks or to reach out to new markets (Cornford, 2001).

In the darker grey section of table 2.1 we can recognise the approach adopted later by the Commission (and probably even more fervently by the Irish government) as one that has been rationalised on clustering theory. Underlying this was the hope that to get regions to develop in the IS it would simply be a case of attracting some technology intensive businesses to set up in a region, and then hope for the other businesses (local and extra-local) to follow suit, the end goal being a burgeoning milieu or technological enclave in the region. The hope was for 'footloose' industries such as back offices and call centres, which had little need for face-to face contact, would come to locate in peripheral regions with a significant positive impact on the local economy.

The main beneficiaries of this 'new industrialisation' were suburban areas in core regions and peripheral cities, such as the Dublin city-region and Galway and Shannon in the case of Ireland, similar examples in the UK would be Leeds and Cardiff (Leyson and Thrift, 1993). Although most call centres are relatively footloose workplaces teleservices are far from homogenous, the services delivered ranging from simple information (e.g. flight times) to fairly complex technical support (e.g. in computing) and different types of call centres, requiring different types of skills, will thus have different locational requirements.

Empirical evidence in chapters six and eight from Shannon and Galway suggests that most high value added service activities remain in core regions and that it is generally the relatively lower value added activities that are dispersed to LFRs. Where *new* products and processes are developed geography becomes a significant location factor primarily because of the importance of face-to-face contact for the transmission of ideas and

knowledge. ICTs serve as a mechanism for enhancing the ability of these central places in core regions to extend their spatial reach, both by controlling less sophisticated parts of the production process and by 'exporting' their own products over the wire but, as this work will show, does little in the way of decentralising core activities in the production process.

At the same time, while there has been an increase in firms' mobility, not all of the regions benefit. Only those that can demonstrate that they have a labour force which can perform the required activities to a high quality can expect to attract the newly mobile services. Furthermore, many core regions are, themselves, realising the importance of these new mobile jobs and are seeking to attract them, thus increasing competition. New levels of mobility facilitated by ICTs also mean that firms can also seek out production locations beyond Europe (Warf, 1995).

Although the volume of information processing is likely to grow, this trend may, have only a limited impact on employment growth in LFRs. First, existing data processing centres are tending to concentrate into even larger sites so fewer regions will attract this form of employment (Gillespie, Richardson and Conford, 1995b). Also the trend is toward the exclusion of more rural areas. Chapters 6 through 8 deal with this problem in Ireland. In my examination of the nature of Ireland's Celtic Tiger, I will show how the term cannot be easily applied in many Irish regions, and as a label is only well suited to the kind of development that occurred in the city region of Dublin and to a lesser extent in Irish second tier cities.

Some final considerations

In a paper published in 1999, John Lovering expresses his fear that the recent upsurge in regional writings (New Regionalism) is a pseudo-academic rhetoric which is gaining high profile in policy (and thereby funding) circles primarily because it is useful in legitimising a territorial reconstruction of governance. He argues that this rhetoric is more likely to encourage regional competition over resources, rather than the creation of a new

regionally sensitive system of European governance which could alter the availability of resources in the first place.

> "it is a discourse which constructs an agenda close to the hearts of a few, but is irrelevant to the majority. It represents the opposite of what radical geography of the 1970s to the 1990s sought to achieve. Which is ironic, not to say tragic, because most of its advocates emerged precisely from a background of radical geography"(pp. 384)

He has suggested that new regionalist theory (NRT) is chronically prone to appropriation by partisan interests. He has also asserted that this is because it carries within it a tendency for sophisticated abstract analysis to collapse in vulgar empirical claims. This tendency to apologia is inherent in NRT because it is ultimately a bundle of policy biases rather than new theory. This is evident in the level of abstraction of the new regionalist writings as well as their 'productivist' and micro-economic examples.

Much of what Lovering points out is hard to refute, such a critique of the dominant orthodoxy is necessary to further the boundaries of science. I have included his critique, to enable reflection on my work. Taking Lovering's stance it is my goal to overcome the barriers to regional thought that he highlights, and possibly refute some of his claims also. I intend to follow neither theory nor policy in flux blindly, but to critically analyse both their impacts on the world today by use of methods discussed in the previous chapter. I use case study regions to enable a more concrete evaluation of theory and policy in time and space specific boundary, thus lending to less abstraction. My choice of regional economic actors are varied and come from public sector, government, and community backgrounds as well as private industry thus enabling a better explanation of the development of regional economies in the information age.

This chapter has provided a firm theoretical basis for what I intend to build on throughout the rest of this work. Highlighting the major schools of thought such as the neo-liberal/determinist and the institutionalist has enabled me to demonstrate the theoretical differences which will become much more evident as we explore the realities that they

have informed. Pitting the two schools against each other is a theme that will run though the core of this work and can be best seen through my comparison of the more neo-classical/incentive-based policies pursued by the Irish government vis-à-vis the more institutional/demand-led approach that has been initiated in Europe through initiatives such as RISI.

Another theme that is equally evident throughout the remaining chapters is my questioning of what it is we mean by development in the information age. Looking at European regions, but paying particular attention to Irish regions, chapters six and seven provide empirical evidence that the geography behind development in the information age is as uneven, if not more so, than it was in the past. Such evidence helps deconstruct the arguments put forward by technological determinists who maintain that space no longer matters in the information age. While there can be little doubt that ICTs have brought about change in not only production processes, but also in the way we live our lives, it remains important not to heed the vast amount of hype and hyperbole that surrounds these new technologies. The theory explored in this chapter sought to explain the changes in the modes of production of new forms of technology as well as the effects that these new processes have of the spatiality of production and thereby development. My thesis is directly informed by these debates and seeks to uncover how the 'new industrialisation' embodied in the technology revolution as well as policy makers' understanding of this process is shaping our world in the 21st century. My argument is unique in how it ties together theories of regional development with the broader theories of economic growth and brings them both into the new era of information technology where I attempt to more clearly define what it is that is meant by regional development in the Information Age.

CHAPTER 3: THE DEVELOPMENT OF EUROPE'S INFORMATION SOCIETY

"Technology and the science that underpins it, is not just a stage-manager, but the playwright of the story of the 20th Century"
(May, 1995. p.i)

Introduction

The Information Society has been on the policy agenda in Europe for the last twenty years. In this chapter I will trace the evolution of thinking and policy making on the Information Society (IS) in Europe, to its emergence as one of the top concerns in the European Commission. Recently, the term Information Society has employed in many areas of European Union policy from the social to the industrial. It is my intention to highlight the origins of IS thinking, and its evolution from its base in industrial policy in the 1980s to its contemporary role in European Union regional and social policy.

In the early 1980s one of the EU's primary policy aims was to close the 'technology gap' which was emerging between it and its main competitors, the United States and Japan. This was a key moment in defining the European Union (EU) as we know it today, for it was in the 1980s that it began to recognise that Europe as a Union had a much greater chance of competing than a Europe of separate nations. Technology was seen as a key driver of economic success and over the course of the 1990s technology began to spread beyond the realm of the economic into the social as computers and web access became a part of everyday life in the developed world. The economic and social impacts of the information revolution became the focus of academics and policy makers alike. The new social guise of technology brought with it a need to re-evaluate policies of the past and out of this came the European Union's Information Society Programmes.

Running parallel to this shift in reality was a shift in the theoretical approach. Innovation policies had highlighted the importance of networking of economic actors and recognition was given to the fact that networking had a geography; network ties were much stronger at the local level (Cooke and Morgan, 1998, Storper, 1997). The focus on the local is one of the key traits that differentiate the neo-liberal from the

institutional schools of thought. As this chapter and the next will make clear, there has been a shift from EU thinking from the former to the latter. The former focuses on the supply-side of the market in its top-down approach with little regard for space, the latter focuses on the demand-side and in its bottom-up approach space is key.

The first section of this chapter deals with the background behind the formation of European innovation policies in the 1980s. The second section will deal with what I see as the first step in the evolution from innovation policy to a policy more concerned with promoting the Information Society: ESPRIT. ESPRIT can be considered a success, probably not for what it set out to do (bring research closer to the market, making European industries pre-competitive), but more so for the change in thinking that was embodied in it. ESPRIT was key in highlighting the importance of collaboration and the sharing of knowledge between various actors in the industrial, academic and public spheres. While initially it proved to be a shock to the more traditional industries, other, more 'forward looking' partners began to see its worth.

In the 1990s several policy documents were published which heralded the Information Society as the answer to Europe's problems of unemployment and competitiveness. Following on from my review of the literature in the previous chapter, in this section I explore the recommendations of these documents and analyse the shift in thinking over the first half of the 1990s in Europe. What we see here is an uptake of a very different theoretical standpoint in terms of development in the information age: from the neo-liberal to the institutional. By way of examining this shift in thinking and policy I use the Regional Information Society Initiative as my main vehicle of analysis. As will be made clear, this EU programme is steeped in the institutional tradition, and can be deemed a turning point in the Commission's approach to developing the region in the information age.

The third section makes the move from theory and policy to reality by concentrating on statistical evidence regarding the European Information Society. Bearing in mind the initial rationale behind IS policy, I look firstly at Europe vis-à-vis its main competitors, US and Japan. I then go on to take the scale of geographic enquiry down, firstly to the national level, to look at the differences between member states within Europe, which leads on to the following chapter in which the scale of analysis is that

of the region. What will become obvious is that the differences between spaces increase further down the spatial scale, providing a better rationale for my focus on regional development in the information age.

Background: Europe's Innovation Policy

The idea of a European Information Society is very much bound up in notions expressed in earlier technology policies. The EU's technology policy sought to 'influence the decisions of firms (and public agencies) to develop, commercialise or adopt new technologies' (Mowery, 1992: 9). In political terms, technology policy offered new opportunities to the Union, not least the promotion of the Information Society (IS). This broad initiative to promote the diffusion of new information technologies became one of the European Commission's 'big ideas' under the presidency of Jacques Santer (Peterson and Sharp, 1998). The selling point of the IS was that it was both a way to modernise European industry and to renew Europe's democratic culture. More specifically, technology policy in the EU was borne out of the fear of being unable to compete with the United States and Japan. In the early years of the Union, Europe was viewed from both the inside and the outside as a group of disparate nations. After World War Two, it became obvious that the European nations had lost the dominance they had once enjoyed over the world economy. Various treaties along with the US Marshall Plan helped Europe regain its foothold on the world economy; post war Europe was also a more united one.

The 1957 Treaty of Rome is heralded as the birth date of what we now recognise as the EU. However, technology policy was absent from this Treaty. One reason for this was that the 1950s was an era when new technologies (such as plastics and polymers, antibiotics and computers) were abundant. Science seemed to be limitless with a plentiful bounty to exploit. Nuclear power was seen to be at the leading edge, and the European Atomic Energy Community (Euratom) treaty aimed to pool the European nuclear experience and capabilities. By the 1960s however, the limitless frontiers of science and technology had given way to anxieties about the increasing 'technology gap' separating the US and Europe. Some key elements lay behind the widening of this gap. American refusals to grant exports licences to number-crunching computers

from European member States was cited, along with European countries falling foul of 'techno-nationalism' (Simmie, 1998).

The 1960s and 1970s were seen as the age of the 'national champion' in Europe. In an attempt to limit their dependence on US supremacy European governments began offering their own companies, subsidies and soft loans, as was advocated by the Keynesian economic policies of the time. Large national monopolies resulted under an era of effective protectionism, not least in the Defence and Telecommunications sectors. The policy of promoting the national champion was, however, very short-sighted, the result of which was the fragmentation of markets and the isolation of Europe's major companies from competition. At the same time, across the Atlantic, deregulation in the US unleashed two high-tech giants, AT&T and IBM, while in Japan, electronic firms were entering the European market, with the sole purpose of becoming household names. So by the early 1980s the technology gap that separated the EU from the US and Japan had indeed widened (Peterson and Sharp, 1998).

To all intents and purposes the technological system we find ourselves immersed in at the start of the 21st century came together in the US during the 1970s. The innovations of that decade represented a qualitative leap forward in the massive diffusion of technology in commercial and civilian applications because of their accessibility and their decreasing cost with increasing quality. The microprocessor, the key device in spreading microelectronics, was invented in 1971 and began to diffuse in the mid-1970s. The microcomputer was invented in 1975 and the first successful commercial product, Apple II, was introduced in April 1977, around the same date that Microsoft started to produce operating systems for microcomputers. The Xerox Alto, the matrix of many software technologies for 1990s personal computers, was developed at PARC labs in Palo Alto in 1973. Digital switching was diffused by 1977. Optic fibre was first industrially produced by Corning Glass in the early 1970s. And last, but by no means least, it was in 1969 that the US Defence Department's Advanced Research Projects Agency (ARPA) set up a new, revolutionary electronic communication network, that would grow during the 1970s to become the current day internet (Hart et al 1992; Castells 1996). Without much doubt one can say that the seeds for the Information Technology Revolution were both planted and had taken firm root in the decade of the 1970s.

It was the 1980s when the idea of the Information Society and the importance of innovation was recognised in Europe. What seemed to be all of the major innovations in new technology were coming out of the United States. The burning issue for European policy makers was how to close the what seemed to be ever increasing technology gap. In the 1990s, the key policy issue became unemployment and the EU's failure again to match the rate of employment creation in the US. Europe's inability to create jobs was viewed as a symptom of its declining competitiveness and inability to exploit new technologies and adapt to the information age. The EU has for the last 50 years been conscious of its position relative to the US and Japan, in this section I will explore further the jostling for positions between the triad, firstly in respect to structural performance throughout the 1990s and secondly in relation to the Information Society as they stand today.

It had become obvious that European attitudes to high technology were in need of an overhaul. It was this realisation in the late 1970s and early 1980s that set in motion initiatives that would have a profound impact, not just on technology policy in Europe, but on the way that Europeans looked at this technology and even the Union itself.

Information Society Policies and the Evolution of the EU[1].

Early efforts to develop common industrial and technology policies were hampered by the tough policy choices facing Western Europe and the difficulties of securing consensus and launching joint actions. Progress was made only when the agenda and membership were flexibly defined, and the detailed work did not command a high

[1] European Union policy with respect to the information society has evolved over the last 20 years, with the focus shifting from the more market-led solutions embodied in telecommunications liberalisation through the 1990s to a more social approach which can be seen in the use of Structural Funds; most notably here the ERDF and ESF. On a European scale the shift can be seen in the move from pre-competitive RTD programmes such as Esprit in the Fourth framework Programme to the more holistic approach involved in the more recent *eEurope* initiatives (launched at the Summit in Lisbon 2000) where the emphasis shifted to the citizen and the need for all citizens to be equipped with the skills needed to live and work in the new information society. Within the Commission there have been different scalar approaches to the burgeoning information society, add to this the setting up of the Committee of the Regions under the Maastricht treaty, and we can see how IS policies were applied to the goal of increasing cohesion across the regions of Europe. Despite some of the serious issues raised by Commission officials in relation to the potential for creating synergy between the Framework Programme and Structural funds, particularly in relation to the cohesion objective for LFRs, an evaluation of some pilot actions under Article 10 in the field of RTD results presented a more optimistic perspective based on the outcomes (Garcia Taabuenca and Lopez-Arangueren, 1998).

political profile (a key trait of EU programmes that followed). Above all, the lack of agreement on the overall thrust of industrial policy and the proper scope of the Community's competence meant that little came of early proposals to create what was seen as a European Technological Community.

Experiments in European technological collaboration thus produced a mixed collection of ventures and outcomes. Attempts to develop collaboration on a (European) community basis, promoted by the Commission, had largely disappointing results. Arguments between governments, differences of national policies and priorities, and difficulties in establishing effective management formulae were all major constraints. Even so, the European Communities in general and Euratom in particular, did much to frame the debates and promote transnational contacts. While efforts to create a European Technological Community were not successful in the outset, they did bear some fruit later. For many the real turnaround came in the 1980s. Against the backdrop of the 1970s, Etienne Davignon, the European Commissioner for Industry from 1977 to 1985 (and also for Research and Technical Development - RTD from 1981 to 1985), organised a new 'Round Table' of top industrialists from the European electronics industry (see Table 3.1) Davignon's message was quite simple: given the gravity of threats from the US and Japan, the European electronics industry had to either improve its performance or collapse. The deal he offered was simple: the Community would develop new programmes to help firms update their industrial knowledge and techniques if they would give up their cosy, protected national niches and attack foreign markets as European-based multinationals. One important outcome was the European Strategic Programme for Information Technology, or ESPRIT.

Table 3.1 The Big 12 Round Table of Industrialists (1982)

United Kingdom	*Germany*	*France*	*Italy/Netherlands*
ICL	AEG	Thomson	Olivetti (Italy)
GEC	Siemens	Bull	STET (Italy)
Plessey	Nixdorf	CGE-Alcatel	Philips (Netherlands)

Source: Peterson and Sharp (1998; p.6)

ESPRIT - setting the tone for the EU's Information Society

ESPRIT was modelled on Japan's Very-Large Scale Integration (VLSI) programme, as were several national programmes in Europe such as the British Alvey project (Keliher 1987; Oakley and Owen, 1989). The VLSI formula was to promote pre-competitive, generic research that had wide applications across many economic sectors. Research was undertaken collaboratively by firms, research institutes and universities. Bringing research organisations together to work on collaborative projects would stimulate transnational linkages, raise awareness of market opportunities beyond home borders and give greater understanding of developments in the global economy. A related concern was to make firms recognise that production was becoming an increasingly collaborative exercise, and in particular that academic-industry linkages needed to be strengthened and extended. There were five traits that are demonstrative of the turnaround in EU thinking which are embodied in ESPRIT.

- First, they were genuinely collaborative. Funded projects had to involve firms and/or research institutes from at least two EU countries.
- Second, funding was on a shared-cost basis for industrial partners. Industry generally met at least 50 per cent of the research costs.
- Third, the Commission laid down broad priorities for EU programmes, but only after extensive consultation with technical experts and user groups.
- Fourth, applications for funding were judged by independent experts and accepted on the basis of academic or technological excellence.
- Fifth, all projects were 'pre-competitive' - that is, concerned in principle with generic or general research, and not research specific to a particular product or process (Peterson and Sharp, 1998).

The first outline proposal for ESPRIT was produced in September 1980. By May 1982, the Commission had put a firm proposal before the Council, and subsequently labelled it at the Versailles European Summit in June (Commission, 1982). The political response was favourable and by the end of the year the Commission had the go-ahead for a first pilot phase costing 11.5 million euro.

The pilot phase was an important element in the Davignon strategy. The Round Table had expressed doubts about the Commission's capacity to mount an effective programme that would not become bogged down in bureaucratic delays. Davignon thus asked for a 'toe in the water', or a pilot phase before seeking any further commitment. A call for proposals in February 1983 drew over 600 responses from 200 companies. Encouraged by this success, the Commission rapidly pushed ahead with plans for a full ten-year programme (1983 - 1993), with an overall budget of 1.3 billion euro.

The first call for ESPRIT proposals in early 1984 met with a huge response, and less than 25 per cent of all bids could be funded. Three-quarters of projects chosen for funding involved collaboration between firms and academic research units. ESPRIT's project list was dominated by projects involving the Big 12 Round Table firms, but more than half of all participating firms were SMEs, which took part in 65 per cent of funded projects and received 14 per cent of total funding. By January 1987, a total of 1.36 billion euro had been committed - almost the entire budget earmarked for what originally had been seen as a ten-year programme (European Commission, 1987).

Since its incarnation, ESPRIT (within the EU Framework Programme more generally) has played a modest, though significant role, in increasing the RTD capacity of cohesion countries by facilitating them to become more interconnected with research networks anchored in core regions. This is a clear example of the dichotomy that faces EU policy makers, whether to concentrate on Europe's most competitive regions or to promote cohesion among a disparate Union. ESPRIT's evolution can be seen as a shift from the former to the latter. ESPRIT was quite unabashed about its primary aim to promote networking among European organisations, and in many ways it played a pioneering role in the promotion of collaborative networks over the past two decades. There exists a continuum of networking, with formal or hard networking at one end, where organisations work together because of their vested interest in each other, such as shares or part ownership. At the other end is less formal or soft networking, where organisations come together through social ties. ESPRIT lies somewhere in between with partners, who, for the most part do not own parts of each other or do not share established social ties (Grimes and Collins, 2003).

ESPRIT and the Promotion of Networking (An interconnected Information Society)

Over the past 20 years the ESPRIT programme has funded thousands of projects relating to information society technology, based on more formal inter-organisational collaboration throughout the European Union. The concept of networking, which from a theoretical perspective has become increasingly significant in recent years, has been one of the primary policy components of ESPRIT, as indeed it has been of other EU research programmes, not least in the RISI programme which I shall explore further in the following chapter. Theorists argue that the rationale behind the promotion of networking is the collaboration and collective learning which it engenders. The concept of collective learning relates to the capacity of particular networks of firms and other organisations to generate and facilitate innovative behaviour through the creation and further development of a base of shared knowledge among individuals within a productive system (Camagni 1991; Lawson 1997).

In the contemporary economic environment of increasingly globalised competition, the role of networking is recognised by theorists and policy makers alike as a critical component of internationalisation. It has been argued that networks are an integral part of the firm's international information and knowledge base and that "internationalisation can be depicted as a process of establishing and building a network of relationships with foreign customers, suppliers, intermediaries, government agencies, financial institutions and the like" (Welch 1999, p 433). Macdonald (1996, 1998) suggests that much of the knowledge which a firm needs for its operations is actually contained in external networks, while Powell and Brantley (1992) note that sources of innovation are commonly found in relationships between firms, universities, research laboratories, suppliers and customers.

Innovation has again become the buzzword in both development theory and policy. Echoing Joesph Schumpeter's schema that 'not to innovate is to die', recent theorists and policy makers have begun to place a great deal of importance on this action (see Cooke and Morgan, 1998). For Schumpeter, and in more recent times Freeman (1988), and Lundvall (1992), innovation is best achieved through a social process. The idea is that innovation is not simply an event, rather a cumulative and ubiquitous process. At

the basis of this contention is interaction and especially the type of interaction bought about by the networking of like firms from which there is a greater capacity to learn and adapt, to diffuse and exploit knowledge and create an environment conducive to innovation.

Among the reasons suggested for collaboration and networking are the need to combine risk and cost sharing, to obtain access to a broad range of expertise and technology, and to speed products to market by reducing development time (Kogut, 1988). There is much less elaboration, however, about the costs of networking, and partly because of the loose definition of collaboration, much of the literature tends to assume that once networks are well organised there can only be benefits (Georghiou and Cameron, 1987). In policy circles much credence is lent to networking because of its nature; as a policy instrument it is extremely appealing both because promoting it involves very little change to the status quo, and because it seems solely to involve benefits with very few costs.

The promotion of networking, therefore, makes a great deal of sense from a public policy perspective, since collaboration can be promoted because of its perceived contribution to the innovation potential and competitiveness of companies. Underlying the ESPRIT programme in its early stages was the concept of 'pre-competitive' research, that is to say Research and Development (R&D) which is distanced from the market and focused on 'generic' or 'enabling' technologies rather than on the development of final-use products targeted for specific markets (Quintas and Guy, 1995). This approach, even if it made little practical sense, was acceptable to the prevailing free-market ideological thinking of the 1980s, when ESPRIT was first established (Georghiou, 1999). What has become clear more recently is that the thinking about networks, which was built into the programme, appears to be based more on what they might potentially achieve rather than on what they actually do achieve (Assimakopoulos and Macdonald, 2001). Thus the network has assumed certain mythical qualities that tend to go unquestioned and at the same time can be incorporated into generalised definitions, which have considerable political value.

Little attention has been given to the potential disadvantages of networking, such as the obvious monetary costs involved in physically networking, but also the

contradiction between ESPRIT's goal of shortening the time from research to market and the firm's goal to reap the rewards of a 'temporal monopoly' with its new research. The advantages of networking tend to be accepted without too much attention to how they accrue. Chief among these advantages is innovation, which is seen as the main purpose of networks of firms (Antonelli, 1992). The official litmus test for ESPRIT was whether or not it fostered innovation. This was to be achieved through the creation of more horizontal formal ties that would bring together the right mix of educational, research and industrial parties. ESPRIT's success would result from the successful integration of third level research with private industry, taking advantage of existing networks of collaboration. Indeed, many can rightly claim that ESPRIT did succeed in doing this (see Grimes and Collins, 2003) but it is very difficult to separate what the programme was responsible for and what it was not, as organisational theory began to push the collaborative agenda over the same time period.

The ESPRIT programme, which recently has been incorporated in the EU's Information Society Technology research programme, has experienced considerable evolution in its research agenda since its inception during the 1980s, towards a greater focus on Europe's Information Society political agenda and on policy efforts to promote higher levels of e-commerce in European companies. Despite the major shifts in the programme from the earlier focus on trying to help European IT corporations to compete more effectively in the world market towards encouraging higher levels of exploitation within European business of information and communication technologies, some deficiencies continue to affect the research programme. However, we can see from the ESPRIT programme that the policy of promoting competition and collaboration within Europe through its technology has evolved.

In 1983, when ESPRIT was first set in train, the burning issue for policy-makers was how to close the 'technology gap'. In the 1990s, the key policy issue became unemployment and the EU's failure to match the faster employment creation of the US. Unemployment was the main focus of the Commission's (1993) White Paper on 'Growth, Competitiveness and Employment'. It highlighted low rates of investment in

the EU and macroeconomic policies that constrained structural change. Above all, the Commission (1993: 49) argued that:

> "The depth of the present crisis is largely due to insufficient progress in adapting the structures of the Community's economy to the changing technological, social and international environment . . . Only through the structural adaptation of industry can the twin requirements of higher productivity and more jobs be achieved"

In the following section I wish to look at the changes that have occurred in the mid to late 1990s and show how they have formed a basis, not least for the Regional Information Society Initiative but for the EU's Information Society initiative more generally. The focus of the Commission began to change in the first half of the decade as social issues came to the fore. Competing with the US and Japan become more of a social issue especially in the area of new technologies. Through the early 1990s we see the publishing of a plethora of documents by the Commission espousing the all-pervasive nature of the Information Society. It was in the 1990s that policy makers advocated the use of Information and Communication Technologies (ICTs) beyond the business realm. The Information Society that would result from the dissemination of these new technologies was to herald an increase in employment growth that would bring benefits to all regions and all parts of European society (CEC, 1993, Delors)

The European Information Society Policies of the 1990s

On a pan-European basis, the advent of the 'technological revolution' has raised some interesting questions about how well the European Commission is adopting to this phenomenon. Because much of the ICT activity is related to private enterprise, peripheral areas are experiencing a number of problems including issues to do with basic infrastructure and telecommunications policy. The pressure within the European arena in relation to liberalising telecommunications has created serious problems for peripheral regions with low levels of demand. The thrust of European telecommunications policy is towards creating a greater level of competition in order to provide the greatest range of services at the lowest cost. This policy is geared more to facilitating the needs of large enterprises than ensuring service provision in remote

regions. A case study in chapter seven demonstrates the severity of the case of broadband supply in Ireland. Since privatisation of the telecommunications industry, the market remains dominated by the incumbent with any degree of competition only witnessed in Irish urban centres. This leaves the more remote regions of Ireland with unsatisfactory provision at an uncompetitive price, this serves as an example of what is going on throughout Europe (c.f. Gillespie, Richardson and Cornford, 2001).

European policy has been closely bound up with demands for greater regulatory freedom in the telecommunications sector. In 1984, AT&T began the move towards liberalisation which ended their effective monopoly in the US. This was followed closely by the UK with the rest of the EU thereafter, with the EU-enforced liberalisation of nationally-owned telecoms in 1998 (Gibbs, 2001). Through use of the Structural Funds, EU regional policy sought to redress that balance in the less favoured regions (LFRs). Yet across the EU grant aid was unevenly distributed because of its allocation by competitive bidding and the diversity of its objectives.

From the 1980s on, the Commission developed a very active policy in the liberalisation of telecommunications. Alongside this was something of equal importance, the promotion of RTD with respect to ICTs. With the Maastricht Treaty, the EU had also explicitly undertaken responsibility for industrial policy in general. The EU strongly supported ICTs, and the transforming of Europe into an Information Society was one of the most important policy goals that was pursued in the 1990s. This political goal was espoused and confirmed through several major documents produced in the decade.

What lay at the basis of the 1993 Delors White paper was the improvement of the basic conditions in Europe. What this meant for the Commission at the time was a regulatory framework for a truly open market to be created across the whole of Europe. The essence of this was the promotion of the free market. In May 1994, the *Bangemann report* (CEC, 1994) was published by the industry commissioner Martin Bangemann. It saw the information society as the product of a "market driven revolution". With which came the possibility for regions to give expression to their specific cultural traditions and identity and for those standing on the geographical periphery of the Union, a minimising of distance and remoteness (Fuchs and Wolf,

1996). The report urged the EU to put its faith in the market and called for the liberalisation of the telecommunications market as well as ending tariffs. The result was to be an IS for all European Society. However, the report gave no clear-cut answer on how to achieve this, it was simply assumed that opening up the market would bring about the IS for us all.

In 1996 a working document was published by the *High Level Group of Experts* (CEC, 1996a). One of the main propositions of the document was that economic cohesion could be enhanced through the use of electronic networks by:

- Improving access to markets and sources of information;
- Bringing work to areas of high unemployment;
- Increasing competitiveness of businesses at the regional level;
- Reinforcing positive externalities through shared infrastructures.

The degree of realism behind this report was refreshing. This was evidenced through the group's expression that there was no automatic guarantee that ICTs would enhance cohesion. They also point out that ICTs could as easily lead to a stronger concentration and centralisation of jobs and services and to a two-tiered information society.

In the interim report from the group, they point to the fact that telecommunications infrastructure are less developed in Europe's LFR's. Therefore the potential threat of an increasingly information-led economy adversely affecting these regions was very real. On the other hand, the experts also perceived the potential for peripheral regions to catch up, provided that ICTs stimulated new commercial activities and the emergence of service providers in these regions. For this, they stressed the need for an integrated EU approach to the information society in order to increase regional cohesion. They pleaded for a more focused approach to infrastructural support and for measures securing the access of different social groups to a reasonable service level at a reasonable price. The group also pointed out the importance of regional institutions for the innovativeness of regions. The group proposed that social policy merited at

least equal consideration with economic policy in formulating the EU's approach to the IS.

Subsequent events include the establishment of the Information Society Forum by the Commission, along with its adoption of the Green Paper *'Living and Working in the Information Society: People First'*. The gradual shift in scope was becoming obvious. Issues like societal aspects of the IS, the role of education and training and increasing awareness had come to the fore in EU IS policy towards the latter half of the 1990s.

At the same time there was increasing recognition of the impacts that the IS was having on Europe's regions. As Commission (1996a) states: "the relevant disadvantage of peripheral regions ... can be reduced through direct connection. However, the participation in the IS of all European regions will not happen automatically, but requires active policy measures" (Pg. 56). These policy measures were seen to involve local regional and national initiatives, not only to attract investment in infrastructure, but also to create demand for information society technologies. Transfer of experiences and best practice already developed by advanced regions were seen as the foremost objective. LFRs were encouraged to create private-public, or cross-regional partnerships, elaborate regional strategies and launch pilot applications through already established initiatives like ESPRIT. The emphasis was placed on the local in the policy initiatives on the Information Society with Structural Funds policies. The more recent eEurope Actions Plan along with the Regional Information Society Initiative (RISI), began to stress these necessary traits (Gibbs, 2001).

The Regional Information Society Initiative

The establishment of RISI can be seen as a direct response to the need to engage with the social context of technology. A Pilot phase (called IRISI) started late in 1994 involving six regions (North West England, Valencia, Saxony, Piemonte, Nord pas de Calais and Central Macedonia) and was funded under the then DGXVI and DGXIII. It had as its main objective the promotion of universal access to the opportunities and advantages of the information society with a view to generating new employment opportunities, improving the quality of life, and addressing the challenges of

structural adjustment and sustainable development. The pilot was deemed successful enough to form RISI and expanded the participant regions to 22. The initiative was based on the argument that the IS is predominantly concerned with socio-economic processes and not about technology in the narrow sense. The IS is about learning processes, cultural change, institutional reorganisation and the use of ICTs to respond to user needs and develop applications. Regions were called on to engage with the IS in a proactive fashion and to avoid the shaping of the IS solely by exogenous forces.

The overall aim was to enable regional partnerships to make better use of existing resources for developing the IS. The objectives were to:

- develop consensus and partnership among key regional actors around a regional information society strategy describing how to face in a regional context, the challenges and opportunities offered by the IS;
- promote commitment and cooperation by the regional actors by developing a regional action plan;
- Provide a basis for the better use of existing regional, national and European resources, particularly that support provided through the Structural Funds.

I will explore the working of the initiative in greater detail in the following chapter. However, it is worth dwelling on the shift in EU thinking that was implied by RISI. According to Morgan (2001), one of the reasons why the new approach (which incorporates RISI and similar programmes) is special, is because it has its roots in Article 10 of the European Regional Development Fund (ERDF). And it is here that we find one of the clearest expressions of regional experimentalism in policy terms. This is evidence of the influence of the theories mentioned in the previous chapter where we see a down-scaling of policy to the regional level as advocated by institutional theory. Despite accounting for less than 1% of a total ERDF budget of 70 billion euro for the period 1994-1999, Article 10 funds have been responsible for some of the most innovative policy initiatives to emerge in Europe in recent years (ibid.). Unlike conventional mechanisms for distributing EU regional policy funds - development programmes negotiated with Member States, Article 10 provides an opportunity for the EU to help establish its own innovative regional pilot studies. That is, Article 10 opens up the possibility for the European Commission to draw upon lessons from policy experiments across European regions and work directly with

regional actors to explore new support measures. In addition, and perhaps most importantly, Article 10 also allows for a greater degree of *risk taking* than is typically possible through mainstream EU regional development programmes, in essence we see evidence of the promotion of entrepreneurial regionalism. This lack of innovation has been particularly evident in the Monitoring Committees charged with overseeing prior development programmes at the regional level.

It is worth remembering, however, that while Article 10 provides the means for the EU (in collaboration with regional institutions) to experiment with new policy initiatives, it does not do so in an overly prescriptive manner. Instead, Article 10 relies on the principle of helping regions to help themselves through initiatives designed to mobilise local knowledge in a process of collective social learning. The philosophy of Article 10 can therefore be summarised in the following terms (Messina, 1997):

- Article 10 is designed to be an experimental laboratory;
- its aim is to promote the innovative dimension of regional policy;
- it seeks to promote partnership between the private and public sectors;
- it enables the internationalisation of regions and local authorities;
- it aims to facilitate the transfer of know-how in the technical, economic and scientific fields between the regions of the EU;
- the positive results of Article 10 projects should be incorporated in conventional regional policies.

In addition to these factors, it should also be noted that Article 10 not only provides an opportunity for the European Commission to engage in policy-related learning; its operating mechanisms also provide a powerful impetus for regional authorities to think strategically about the needs of companies and about the appropriate role for public sector intervention. In this sense then, Article 10 aims to set in train a series of interactive intra- and inter-regional learning processes. These features have been particularly evident in the recently established Article 10 programme for RISI.

The origins of the RISI programme can be seen in the context of the growing realisation that Europe's most prosperous regions have succeeded in appropriating the overwhelming share of EU science and technology resources, the so called

Framework Funds. The Commission's own estimates, for example, suggested that some 50 per cent of all research and technological development (RTD) funds were concentrated in just 12 'islands of innovation' - Amsterdam, Rotterdam, Ile de France, the Ruhr, Frankfurt, Stuttgart, Munich, Lyon, Grenoble and Turin (European Commission, 1996b). The explanation for this disparity is to be found in the Commission's use of the principle of 'scientific excellence' (traditionally lacking in LFRs) to guide the distribution of funds. EU policy, in this respect then, has tended to exacerbate rather than redress the socio-economic disparities found in the EU.

From the above we can appreciate how the EU's IS policy has evolved over the past 20 years. From its grounding in innovation policy in the early years, we can see how it has shifted from economic competitiveness and grown into a programme more concerned with social cohesion and regional development. At the same time policies designed to bring about the IS in Europe have recognised that it is not simply a case of supplying the infrastructure and hardware, but that its promotion needs to be pushed from the demand side, top-down has been replaced by bottom-up. A considerable amount of time and money has been put into developing or 'harnessing' the IS in Europe. In the next section I will look at the current state of the IS in Europe by employing various indicators. I firstly look at the EU relative to what is considered its main competitors, the US and Japan, before going on to look at the IS picture within Europe.

A European Information Society?

We are often told that new information and communication technologies (ICTs), perhaps best represented by the internet, are changing everything: this is a revolution bringing about the remaking of the world. The vision of the information society often takes the character of an all-encompassing story about this new age. From McLuhan's global village and Fritz Machlup's work in the 1960s there has been a buzz about the increasing role of information in a networked world. By the 1990s it might have been said that the global village has arrived with increasing numbers of households accessing the internet, the spaceless community was achieved. One of the main aims of this work is to dispel the myth that a spaceless society exists, for as I will show, geography and spatial differentiation is alive and well as is demonstrated by the increasing disparity in regional growth figures across Europe.

Placing Europe in the Triad: Europe's IS v US v Japan

Table 3.2 gives a brief statistical introduction to the relative performance of the triad. As we can see in absolute terms the EU lies behind the US but ahead of Japan, however, taking account of relative populations, the picture changes, we can see that the EU while just behind Japan trails considerably behind the US. The gravity of the situation becomes that bit more acute in the temporal sense given that the EU fell further behind over the decade of the 1990s. A more positive trend emerges over a longer time period, stretching back to 1980, which shows the average growth rate and labour productivity rate of the EU second to the US, while Japan's figures are slightly behind, due mainly to the economic turmoil of the late 1990s. The final statistic depicts the unemployment rates of the three and it is here that the chasm between the EU and its competitors widens. Unemployment has proved to be one of the greatest worries for EU policy makers, and average rate of 10% can justify their employing as many instruments to correct it as possible, not least adopting to the Information Society. Table 3.3 looks at the structural change involved in the adoption process.

Table 3.2 General Economic Statistics amongst the triad

	EU	US	Japan
GDP (Bn Euro) 1999	7989	8725	4081
Per capita PPS (Purchasing Power Standard) 1990 (EU = 100)	100	145	105
Per capita PPS 2000 (EU = 100)	100	156	110
Average Growth 1980 – 2000	2.5	3.9	2.1
Labour Productivity Growth 1980 – 2000	1.7	2	1.6
Unemployment rate % 1995 – 2000	10.1	4.9	3.9

Source: Eurostat (2001)

A number of indicators allow us to assess Europe's ability to respond to structural change. Trade flows are a traditional method of measuring competitiveness. By identifying those sectors that are relatively R&D intensive, it is possible to separate figures for 'high tech' sectors from other, more traditional sectors. Taken as a whole the EU's performance has been poor. A relatively low percentage of total EU exports - 17 per cent - were high-tech products in the early 1990s, compared with the US (31 percent) and Japanese (27per cent) totals (Commission 1992b).

As Table 3.3 shows, compared with its competitors in the so-called triad Japan and the US, Europe remained weak in the sectors crucial to economic modernisation and the information society: electronics, office equipment and data processing.

Table 3.3 European performance in technology-intensive sectors

Sector	Europe's ranking in the triad	Trade balance trend
Aerospace	2	Stable
Chemicals	1	Increasing
Pharmaceuticals	1	Increasing
Electrical Equipment	3	Stable
Data processing and office equipment	3	Falling
Electronics	3	Falling
Motor Vehicle	2	Stable
Scientific instruments	2	Falling

Source: European Commission (1994)

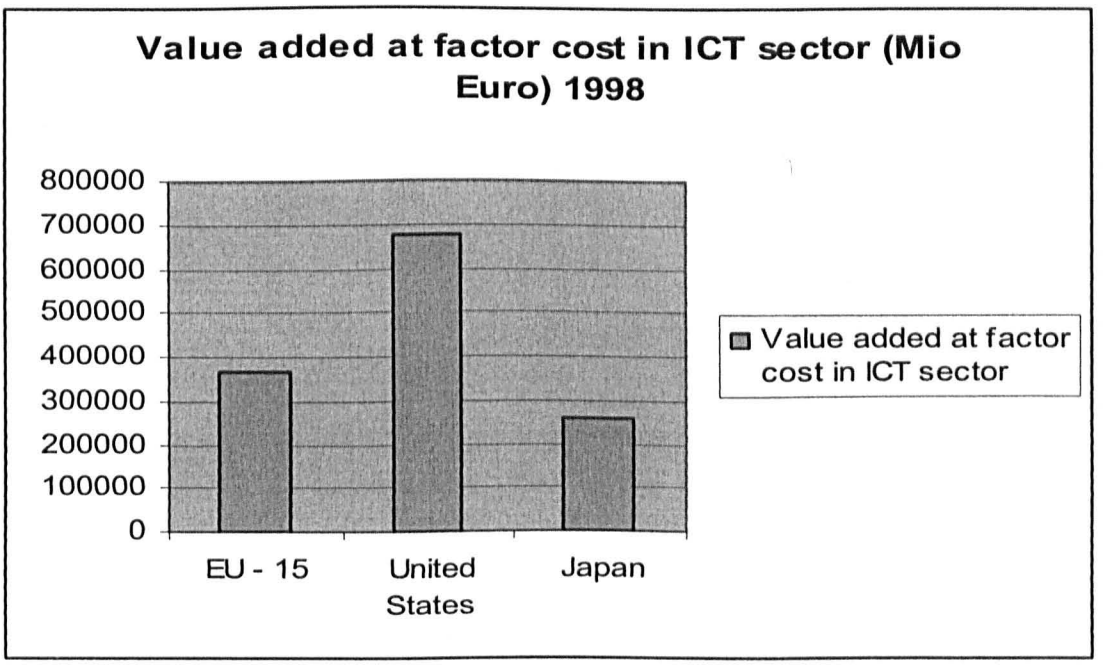
In Table 3.4 we see R&D expenditures of the triad, here again, the EU is not cast in a favourable light. R&D as a percentage of GDP was lower than for many of Europe's competitors. Significantly, the proportion of R&D financed by industry in Europe was low, indicating less willingness on the part of the private sector to attempt innovation. Conversely, the figure given for government expenditure shows a relatively higher dependence on State financed R&D in the EU than in Japan and the US.

Table 3.4 R&D indicators for the Triad - 1998

	EU 15	USA	Japan
Total R&D Expenditures ($M)	127,643	191,526	81,514
Total R&D expenditures as % of GDP	1.85	2.29	2.98
Total R&D expenditures per inhabitant ($)	343	494	649
% of total R&D expenditures financed by governments	39.1	36.4	22.8
% of total R&D expenditures financed by industry	52.7	58.7	67.1

Source: OECD (2000)

Figure 3.1 Value Added at Factor Cost (ICT sector)



Source: Eurostat (2002)

Looking at how the structural change has transpired into industry, figure 3.1 tells us that the value added factor cost of the ICT industry in Europe was 365 billion euros in 1998. This figure was nearly doubled by the US, which demonstrates a different

league in comparing the ICT industry between the two. Japan achieved over 200 billion, which again puts the EU figure to shame if we consider the fact that the population of Japan is nearly half that of the EU. The differences between the separate nations of the EU is stark and will be explored in detail later.

Another important measure to see how economies are adapting to the change is the presence of e-Commerce. In a narrow sense, e-commerce can be defined as a transaction reflecting the sale or purchase of goods and services via the internet. The transaction could be carried out through a web page, extranets or other web enabled applications including mobile phones and TV sets. Table 3.5 shows e-commerce figures for the triad and in many ways paints a more promising picture for Europe.

Table 3.5 E-Commerce Standings

E-Commerce	EU	US	Japan
Enterprises selling on-line 2001 (%)	26	28	20
Enterprises purchasing on-line 2001 (%)	46	53	15
SMEs with internet access 2001 (%)	70	41	27
SMEs with a website 2001	40	30	18
Number of teleworkers (as % of labour force) 1999	6.0	14.7	7.9

Source: Commission (2002)

More enterprises buy on-line than sell on-line in both the EU and the US, however the opposite is true for Japan, where the percentage of the country's enterprises actively engaged in on-line buying or selling is much lower than its two competitors. With close to a quarter selling and one-half of enterprises buying on-line in the EU and US, e-commerce looks healthy. Looking at the number of Small and Medium Enterprises actively engaged in e-commerce we see how dynamic these enterprises are in Europe, where they are considered the backbone of the economy. With 70% of SMEs involved in e-commerce in 2001 and 40% with their own websites, EU SMEs leave their

equivalents in the US and Japan far behind. However, looking at the amount of teleworkers in each of the three, the EU slips back in terms of ranking. Here a mere 6% of the labour force were defined as teleworkers in 1999, compared with 14.7% and 7.9% respectively in the US and Japan. Now I would like to turn the attention to measures of the Information Society in the triad to rank the EUs performance relative to the old foes. These more up-to-date data will prove an important test for the EU's IS policies to date.

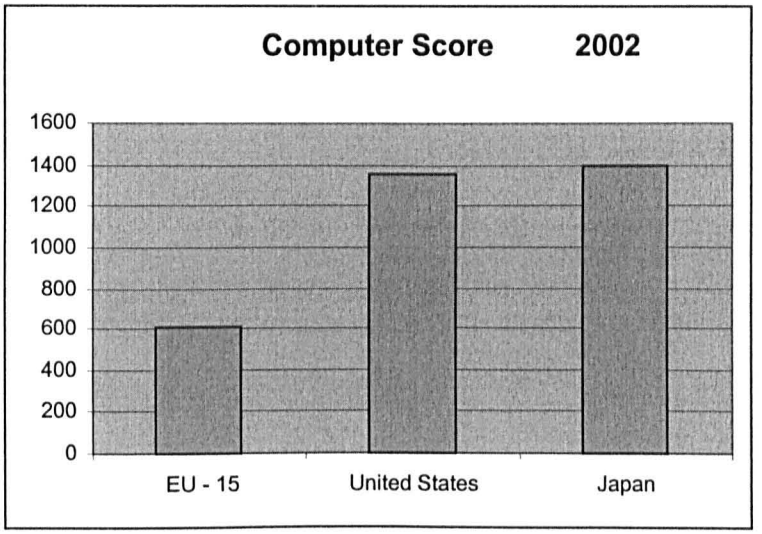
Information Society Index

As already mentioned the concept of the Information society, while much analysed, is still a very loose one, not least because it encompasses many facets of social and economic life. For this reason it is difficult to point to any one indicator as being the true measure of the IS. In this section I will employ data from different sources which will account for 25 indicators measuring the capacity to exchange information (see appendix 3). For ease of interpretation the measure is reduced to four specific areas, the sum of which gives the overall information society index. It is important to consider all measures in relation to each other. Measuring the IS on a purely technological basis will fall far short of painting the true picture. The reason for this is that as soon as countries reach some theoretical maximum of technology penetration, the differences between information societies will not reside in how much technology they have adopted but how they have adapted to it. PCs in schools, for example, will be of no real help if the country is lacking a good education system. For this reason it is important to include social infrastructure as a key indicator of the IS, for once technology saturation is achieved, without the appropriate social infrastructure the society can advance no further into the Information Society.

Computer Infrastructure

This measure includes numbers for Personal Computers (PCs) installed per capita, home PCs shipped per household, Government PCs shipped per professional workforce, Education PCs shipped per student, Percentage of networked PCs, Software/Hardware spending. Figure 2.2 shows the performance of the triad under this measure.

Figure 3.2 Computer Score



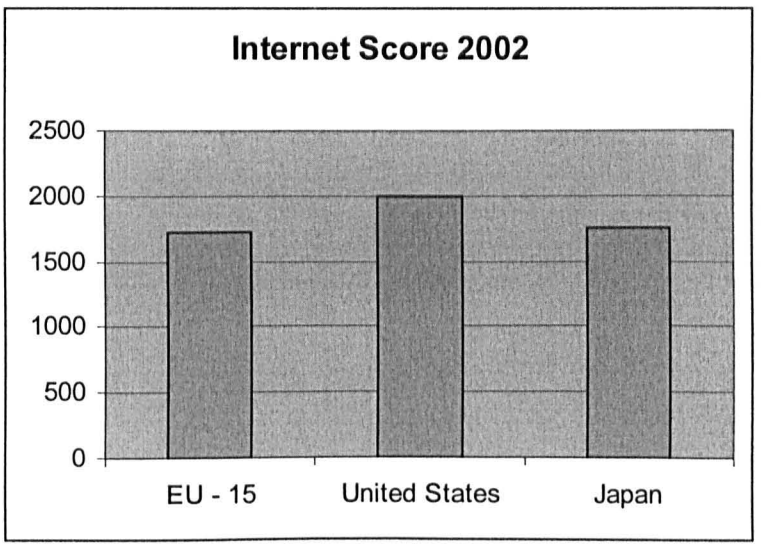
Source: ISI, 2003

For this measure we see that Japan ranks the highest out of the triad, with the US in close second. From this indicator we can see that both countries are well stocked with the hardware necessary to flourish in the IS, while the EU lies far behind with less than half the score of Japan and US. Penetration of PCs in the EU falls behind that of its competitors with 30 per 100 inhabitants in 2001 compared with 37 and 60 for Japan and the US respectively (Eurostat, 2002).

Internet Infrastructure

This indicator is a conglomerate of other indicators which are integral to performance in the IS, they include: amount of e-commerce, number of internet home users, number of internet business users and, number of internet education users. This measure is important to the information side of the IS. It is also dependent on the last measure as access to the internet is most usually via computers. However, as technology moves on more and more people are accessing the internet via mobile devices, most notably mobile phones.

Figure 3.3 Internet Score



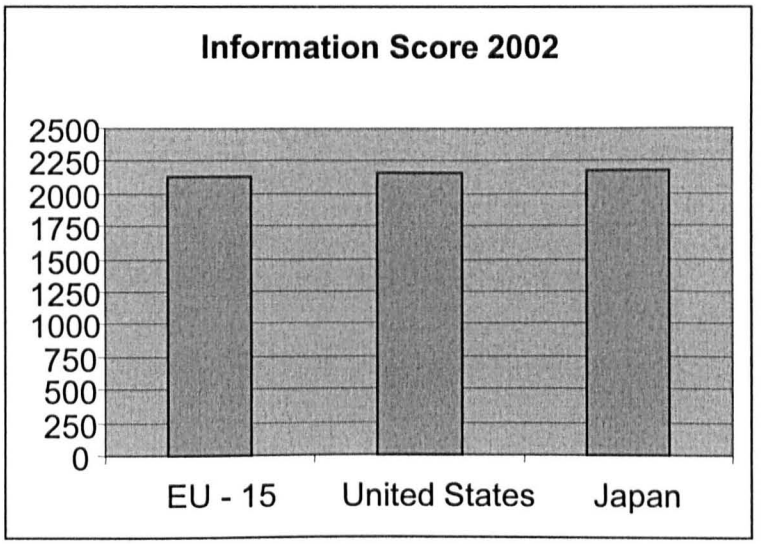
Source: ISI, 2003

The EU fares relatively well in this IS score. It is marginally behind to Japan, but again a considerable gap divides it and the US. There is a great deal of diversity for this score within the Union, with nations such as Sweden and the UK ranking as some of the top nations on the Internet score, while Portugal, Greece and Spain have a much lower score. This will be explored later on in greater detail. It is also worth noting that the top score for the triad (US = 2,004) itself falls significantly behind other nations like Australia, Singapore and Canada.

Information Score

The information score is somewhat more diverse, comprising of measures, such as; telephone lines per household, costs of local calls, television, radio and fax ownership per capita, mobile phone penetration and cable subscriptions. The individual measures are diverse which makes the overall score somewhat broadbrush; however, for the purposes of measuring the stocks of the IS in the triad it serves some purpose.

Figure 3.4 Information Score



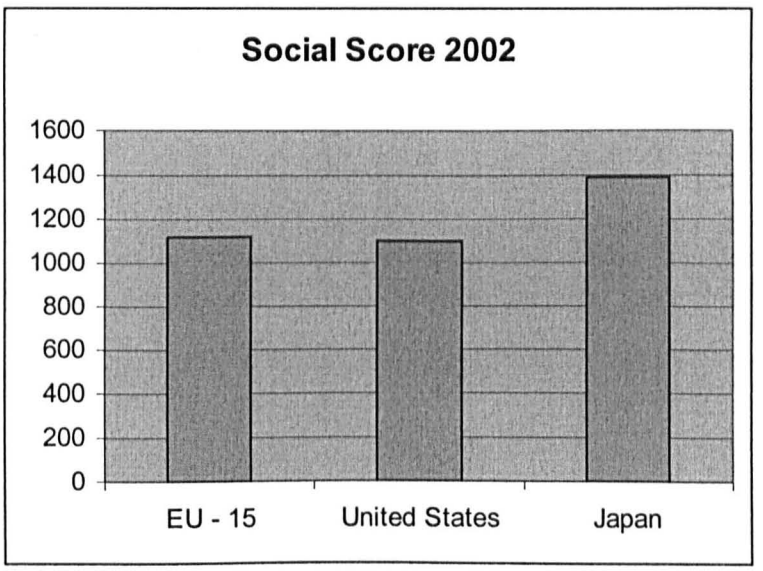
Source: ISI, 2003

The Information Scores of the triad are grouped closely around the 2,200 mark. Japan comes out on top with a score of 2,176 followed closely by the US, and again last of the three is the EU, albeit by a small margin. The diversity of this score can help explain the narrow margin between the three, while the US might rank high in terms of low telephone charges and cable subscription, the gap is made up by the other two in the relatively high mobile phone penetration in both markets.

Social Score

The social score is seen as of increasing importance in trying to measure the presence of the IS. Indeed, for too many years it has been ignored by researchers and policy makers alike. The EU has seen its share of IS programmes fall by the way-side as a result of ignoring the social implications of promoting the IS. Here, the social score includes: secondary school enrolment, third-level enrolment and newspaper readership among others.

Figure 3.5 Social Score



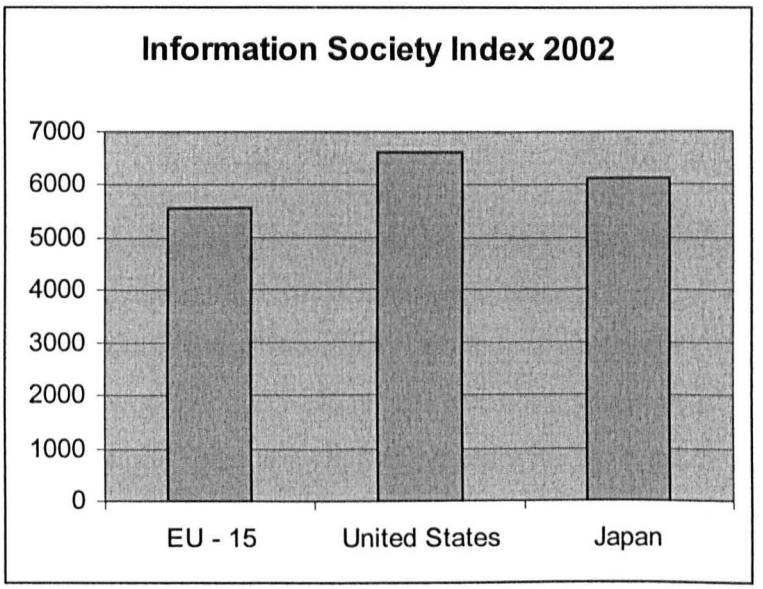
Source: ISI, 2002

Japan's score of 1,394 leaves both the EU and the US a considerable distance behind. With respective scores of 1,115 and 1,099, the EU and the US demonstrate that they have a considerable amount of work to do in this field. Both scores put them behind countries such as Malaysia and Taiwan. Numbers leaving school at an early age is one of the primary concerns for the two states. There is an obvious need to redress this as it has consequences for all areas of society, not least the information society. Skills shortages are one result of a high proportion of early school leavers, without the appropriate level of skills and competencies, no state can expect to thrive in the Information Society.

Information Society Score

There is no true numeric level at which you achieve IS status, the only thing you can do is measure a country's IS relative to another's. The following graph gives the overall score on the information society index which is a composite of the four scores that we have seen. The highest score that was achieved by any one nation was 7,087 which was scored by Sweden (Portugal scored 4,079 - again showing the disparity within the European Union).

Figure 3.6 Information Society Index



Source: ISI, 2003

With a greater array of figures available today we can compare the existence of an information society between the triad of the US, EU and Japan. To claim that either are in fact an information society would be rather grand, this is a point that will be addressed in a later chapter. But what we can do is compare how the three are adopting to the information revolution that is bringing about the IS. As figure 3.6 makes clear the EU remains behind the US and Japan in terms of information society measures. Considering the graphs that went before, this is of little surprise, with the EU coming last of the three in all the measures excluding the social score. Partiularly poor performances in the computer score and again in the social score are keeping the EU consistently behind the US and Japan. Poor scores in both these ranks suggest a structural weakness which is keeping the EU behind its competitors. What is perhaps most worrying about the EU situation is that not only in economic terms has it fallen behind the US and Japan but also in social terms. The policy response in Europe over the last 20 years in terms of the IS, has shifted from the economic to the social. Over the same period of time we have seen Europe's place vis-a-vis its competitors weaken.

In the following section I wish to look at the EU in more detail. In so doing I will bring down the scale of geographical enquiry to the 15 member states. In doing so it will become clear that the EU is itself diverse, not least in terms of IS measures.

A Diverse European Union

Table 3.6 displays the disparities between the member states of the EU, the three richest in absolute terms (Germany, France and UK) dwarf the smaller economies of Ireland, Greece and Denmark. Looking at per capita PPS, we begin to understand the relative wealth of EU citizens. Luxembourg remained the richest over the ten year period, while Greece swapped places with Portugal to become the Union's poorest. The country of most note over the ten year period of the 1990s has to be Ireland, moving from third poorest to second richest over a decade. This change in fortunes is reflected in the average growth rate over 2000 where Ireland scores highest with 10.7% while countries like Germany and Denmark lie much further behind with scores of 3% and 2.9% respectively. Ireland again ranks highest in terms of labour productivity growth which measured 5.7%, but with figures like 0.8% for Spain and 1.4% for Sweden, the gap between member countries becomes clear. Unemployment figures make for grim reading for some countries with rates up to 12% and 15% in France and Spain.

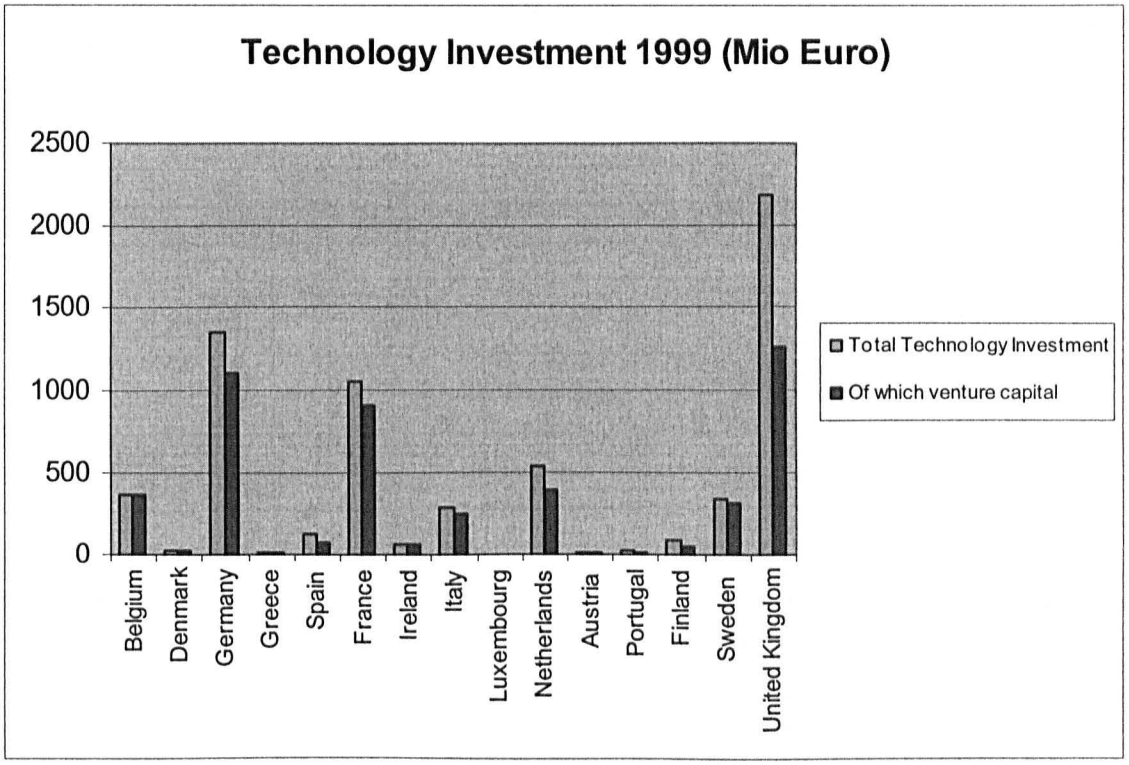
Table 3.6 Country Statistics

Country	GDP Bn Euro 2000	Per capita PPS 1990	Per capita PPS 2000	Average Growth 2000	Labour Productivity Growth	Unemployment Rate 2000
Belgium	234	105	111	3.9	2.2	8.6
Denmark	165	111	120	2.9	2.1	5.1
Germany	1982	115	106	3	1.4	8.9
Greece	117	63	68	4.1	2.9	11.7
Spain	563	73	83	4.1	0.8	15.7
France	1344	112	98	3.2	1.2	12.1
Ireland	88	68	121	10.7	5.6	5.7
Italy	1099	102	100	2.9	1.4	11.7
Luxembourg	18	141	192	8.5	2.8	2.4
Netherlands	374	104	115	3.9	1.4	3.6
Austria	197	106	112	3.2	2.3	4.7
Portugal	106	56	76	3.3	1.6	4.6
Finland	121	102	104	5.7	4.1	11.7
Sweden	226	114	103	3.6	1.4	7.6
United Kingdom	1353	99	102	3.6	2.0	6.1

Source: Eurostat (2002)

In terms of R&D figures, we have already seen that the EU on the whole fares pretty badly when compared to Japan and the US. Looking at investment in technology for European member states, again shows us a considerable degree of differences between the states that make up the Union.

Figure 3.7 Technology Investment



Source: Eurostat(2002)

Figure 3.7 shows the amounts each member state has invested in technology in 1999, and the differences are rather stark. The UK, for instance invested well over 2 billion euro, while the likes of Sweden barely managed one-quarter of a billion (no figures for Luxembourg). Other States like Austria, Portugal and Greece faired even worse. Another interesting indicator in the graph is the percentage of technology investment that came from venture capital; for the EU as a whole 4.4 billion or around two-thirds of the total. While this may seem like a large sum, it is indeed very little compared to the US and other countries, the respective figure for the US in the same year was 18 billion euro. The UK has the largest amount of money invested in technology, but it is the country with the least proportion of investment backed by venture capital. Countries like, Belgium, France, Ireland and Italy have a much higher percentage of investment accounted for by Venture Capital, this is demonstrative of a vibrant technology market, where investors have enough confidence to put their money behind technology projects.

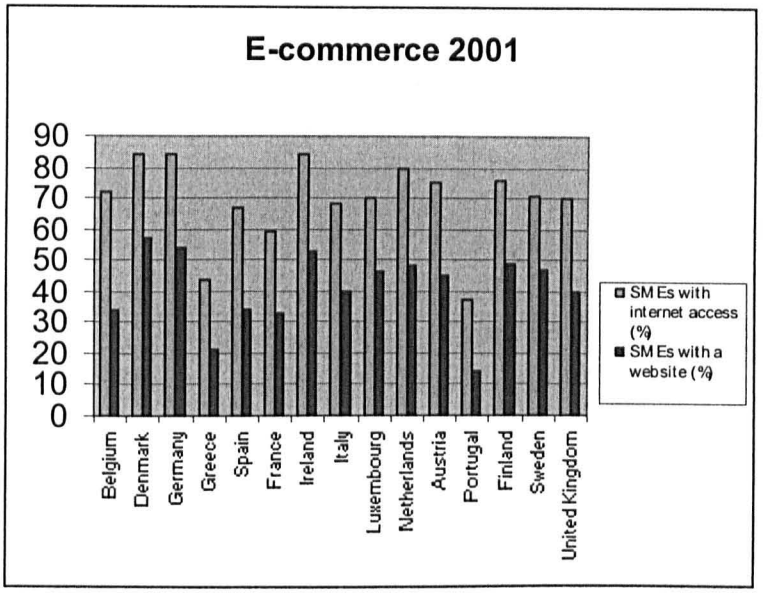
Table 3.7 Number and value added in ICT enterprises

	Total number of enterprises in the ICT sector (percent of EU total)		Value added at factor cost in ICT sector (Million Euro)
EU - 15	389000		365000
Belgium	n/a		9340
Denmark	2463	(0.66%)	6934
Germany	47998	(13%)	88794
Greece	n/a		n/a
Spain	20250	(5.5%)	14895
France	47390	(12.8%)	36019
Ireland	1854	(0.5%)	4306
Italy	71830	(19.5%)	33535
Luxembourg	838	(0.2%)	n/a
Netherlands	15580	(4.2%)	9294
Austria	7771	(2.1%)	7840
Portugal	3746	(1%)	4178
Finland	5489	(1.5%)	8949
Sweden	22403	(6%)	11803
United Kingdom	120506	(33%)	88518

Source: Eurostat (2002)

The United Kingdom again stands out but this time it is for the amount of enterprises in the ICT sector; with 120,506 registered in 1999, the UK accounts for one-third of the EU's ICT enterprises. Together with France, Germany and Italy, these four countries account for 79% of the EU's ICT enterprises, with the UK boasting the highest per capita share followed by Italy. Looking at the breakdown of the value added at factor cost, some differences again emerge. With only half the amount of enterprises of the UK, Germany actually surpasses the UK in terms of value added, a significant issue, which speaks volumes for the nature of enterprises in Germany. In this score, France also leap-frogs Italy, which again points to the differences of the structure of the industries in the respective countries. The same pattern emerges when Ireland is compared to Portugal; the Irish contributing more value added than their Portuguese counterparts.

Figure 3.8 E-Commerce



Source: Eurostat (2002)

Figure 3.8 paints a fairly positive picture of the state of e-commerce in the EU. With the exception of Portugal and Greece in all other EU states over 50% of SMEs are connected to the internet. Ireland, Denmark and Germany score the highest, all with 84% of their SMEs doing business on the internet. These are closely followed by the Netherlands, Austria, Finland and Sweden. The second measure adds more weight to SMEs involvement in e-commerce; having a website shows virtual presence on the net and puts the enterprise in a better position for doing business on the web. The leaders here are again Denmark, Germany and Ireland, with over half the SMEs in each of these countries having a web-presence. Portugal and Greece, again take up the rear, with only one-fifth of SMEs in these countries having a website.

Table 3.8 E-commerce[2]

	DK	D	E	F	IRL	I	NL	FIN	S	UK
Enterprises Selling On-line (%) 2001	28	21	21	21	33	13	22	45	17	39
Enterprises Purchasing On-line (%) 2001	51	46	43	36	56	31	41	56	52	49
Number of Teleworker (%) of Labour Force 1999	10.5	6.0	2.8	2.9	4.4	3.6	14.5	16.8	15.2	7.6

Source: European Commission (2002)

Table 3.8 gives us some further insight into the e-commerce situation across Europe. The percentage of companies buying on-line is highest in Ireland and Finland with 56%, followed closely by Denmark and Sweden. The percentage of companies selling on-line is again highest in Finland and Ireland, but this time followed by the UK, while the lowest is Italy. Another important measurement of E-commerce is the number of people who telework. There is a distinct geography behind this, as teleworking is much more popular in the Scandinavian countries, with figures for Finland and Sweden being 16.9% and 15.2% of the workforce respectively. At the same time, the figure for the southern European countries is much lower.

[2] Excluding figures for Belgium, Greece, Luxembourg, Austria, Portugal

Table 3.9 Information Society Index

Country	Computer Score	Internet Score	Information Score	Social Score
Sweden	815	2622	2265	1385
Denmark	743	2170	2486	1213
Netherlands	770	1898	2490	1317
United Kingdom	782	2224	2292	1139
Finland	671	2132	2283	1337
Germany	623	1902	2248	1134
Austria	660	1884	2175	1123
Belgium/Luxembourg	580	1558	2087	1107
France	626	1504	1891	1068
Ireland	593	1452	1985	1020
Italy	452	1410	2001	885
Spain	363	1176	2034	1006
Greece	445	1374	1731	921
Portugal	378	888	1861	952

Source: ISI, 2003

Table 3.9 shows us the Information Society score for each of the member states. The scores again are diverse and show the extent of the gaps between the European Union States. Looking first at the computer score, which takes account essentially of the hardware necessary to perform in the IS we see that Sweden and the UK lead the way, accounting for first and second places respectively. On the other end of the scale, we have Portugal and Spain, which rank well down the list with a score under half that of the top member states. With an average score of 607 for the Union as a whole we can see that the high scores of Sweden and the UK, skew the mean somewhat, and that for the most part EU countries score relatively poorly on this measure.

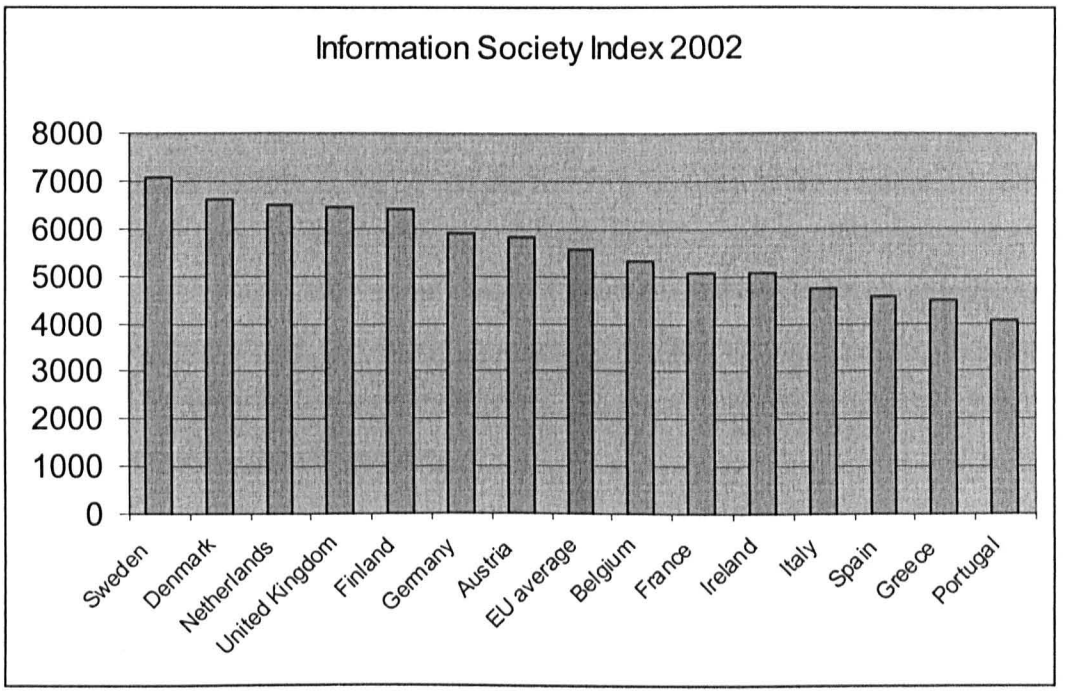
The internet score is a combination of country scores in internet users at home and in business. Here again we see a considerable gap separating the member states. Sweden and the UK again top the list while again we see the Iberian countries come last, with

scores less than one-half of the EU leaders. The average score for the EU is a better reflection of the mean. In March 2001, just under one-third of the EU population had access to the Internet, the total number of EU internet users is estimated at 114 million. Among the EU member states the highest penetration is reached in Sweden (62 out 100), followed by the Netherlands, Denmark and Finland (above 55/100), while the lowest rates are found in Greece and Portugal, with 12 Internet users per 100 inhabitants. The competition among national telecom companies has been a determining element in the Internet boom in Europe. Moreover, the fact that most fixed networks have introduced special offers of combined services to their customers, identifying the Internet as a key service, has contributed further to its rapid acceptance.

The information score takes account of other aspects of technology in countries, including phones, faxes and cable television. The overall score of this indicator puts the Netherlands on top, closely followed by Denmark. What is interesting to note about this measure is that the scores are relatively tightly packed, from the Netherlands high of 2,490 to Greece's low of 1,731, suggesting a level of saturation in the information markets. One example of this is the mobile market; mobile phones per inhabitant have increased exponentially over the six years from 1996 to 2001. For the EU as a whole it increased from 7 persons per 100 in 1996 to 64 per 100 in 2001. The highest penetration rates were in Sweden and Finland, which is partly explained by their industrial structures. Most notable is Italy where nearly 3 in every 4 people have a mobile phone (thus boosting the country up the Information score rank). While the country with the least penetration is France, with 50 persons per 100 inhabitants owning a mobile phone, however, though this may be the lowest score in Europe it still tops the score of Japan and the US, with 47 and 40 mobiles per 100 inhabitants respectively.

On the Social Score the country with the lowest ranking in the EU is Italy, while that with the highest is once again Sweden. The gap between the two is enough for the Italian policy makers to worry about. The difference between the two is most striking in terms of educational attainment. While over half the population of Italy only has a low educational attainment, the corresponding figure for Sweden is 21%, while nearly one third of the Swedish population has a high level of educational attainment, compared with only 10% of Italians.

Figure 3.9 Information Society Index



Source: ISI, 2003

Figure 3.9 depicts the array and diversity of the Information Societies in Europe. Sweden is in the proud position of having scored highest in these terms of measuring IS assets, a group of four countries follow which include: Denmark, the Netherlands, the United Kingdom and Finland. All of these countries score well and indeed find themselves in the top 10 nations worldwide in terms of IS scores (ahead of Japan, but behind the US). Germany and Austria rank higher than the EU average, after which countries begin to fall off more rapidly and the differences between them become greater. The Final five countries are the Cohesion countries of Portugal, Greece, Spain, Italy, and probably most notably Ireland. The Irish case is an interesting one, because its ranks relatively poorly in terms of Information Society, while at the same time, comes top of the list in terms of other measures such as value added ICTs, e-commerce etc. This is an interesting point which will be explored in greater detail in chapter six. At the heart of it, are two key questions about the nature of the IS. First, is it a completely social construct, or is it intertwined with economics? And second does Ireland have an Information Society, or was its growth over the decade of the 1990s purely economic?

Conclusion

This chapter has outlined the path taken by the European Union in its attempt to adapt to the information age. I have shown how European strategies/initiatives promoting the Information Society in the 1990s are firmly grounded in the innovation policies of the 1980s, and how the evolution over the two decades can be interpreted as a logical one. Over the two decades Europe placed a great deal of emphasis on innovation in its attempt to compete in the world market, a market which has been increasingly dominated by high-technology industries. The term innovation became synonymous with this new high-growth industry.

As the spectre of high technology infiltrated society through increased sales of Personal Computers and more households logging-on, policy makers began to recognise the importance of creating an information aware society. EU policy makers interpreted this as a natural progression from the business to the social sphere. This rather simplistic interpretation inspired IS policies in the 1990s which bore all the mechanistic and deterministic traits of the innovation policies of the 1980s.

Information Society Technologies were hailed as the panacea to European development ills. Policy makers in Brussels were inspired by the technological evangelists who hailed an information revolution where telecommunications would be the new infrastructure and that stubborn geography and peripherality would be a thing of the past. Indeed many commentators identified a strong positive correlation between measures of the development and uptake of telecommunications and measures of economic development (such as main telephone lines per inhabitants and GDP). A number of studies have also identified the existence of positive relationships of this sort at the regional level (Biehl, 1982; Parker and Hudson 1995; Spectrum, 1999). This first significant study to address the question of the direction of causality (Hardy, 1980), concluded that the evidence supported bi-directional causality; an increase in the number of telephones per capita caused economic growth and economic growth caused an increase in the number of telephones. Subsequent analysis by Cronin et al (1991; 1993) confirmed the bi-directional causality first

identified by Hardy. Not only do increases in GNP or output lead to increases in telecommunications investment, but the converse is also true – with the causality significant in both directions leading the authors to suggest 'employing telecommunications infrastructure investment as a means to stimulate local economic development' (Cronin et al 1993:426).

With regards to issues associated with the IS, the predominant policy response in the 1990s followed on from the above argument to focus on the supply-side approach. This approach essentially conceived of the IS as a *technologically driven* phenomenon whereby regional problems such as peripherality and geographically constrained markets can be overcome through the application of technology (Gillispie, 1997). The EU STAR programme, is a perfect example of this. Between 1987 and 1991 some 780 million euro of funding were provided from the ERDF in order to accelerate infrastructure. The primary aim of the programme was to "break the cycle by which demand for advanced telecommunications services is too low to justify supply on commercial grounds, in which case lack of awareness of the benefits of ATS depresses demand still further" (CEC, 1991). This programme aimed to stimulate regional development through infrastructure provision, as have initiatives like the Highlands and Islands Telecommunications Initiative in Scotland. In many cases, though, the provision of infrastructure has been well in excess of demand and the expected benefits have not materialised or been at lower levels than originally envisaged. (Gillespie et al. 1995).

The supply-led, mechanistic approach to development in information age did not provide the answer to Europe's competitive problems. In terms of the quantifiable facets of the information society we have seen how Europe over the period of the 'information revolution' has actually fallen further behind its main competitors. Europe's failure to grasp the benefits of the information age is evident in both social and economic terms. The gravity of this situation becomes more severe once we bring the scale of analysis down to the national level. Evidence presented in this chapter has shown that on the member-state level there have been clear winners and losers in terms of ability to adapt to the information age. Chapter four brings the analysis further down the spatial scale to the regional level, and we see that as the scale

decreases the level of divergence in terms of the gap between the winners and the losers/ information-rich and information-poor increases dramatically.

Europe can be considered a Union of regions as well as a Union of nations. Map 3.1 (GDP per capita by region) paints that picture very clearly. While statistics and information on the regional level is not as easily available as that on the national level, some to the broad economic statistics make that clear. In terms of GDP per capita (PPS), employment, unemployment and educational attainment, the performances of EU regions, is much more diverse than that of nations. The gap between the richest and the poorest is much greater at a regional level than at a national level. With an EU average of 100 in terms of GDP, Europe's richest region, London can enjoy GDP 60% above the EU average, while a region like Acores in Portugal can only manage to attain 40% of the EU average. Differences are not that great on a national level, so within Europe regions are becoming the more important scale of spatial investigation. However, there is little new in this; for many years now the European Commission has acknowledged this fact, indeed vast amounts of the EU's budget goes to the Structural Funds which can be seen as a direct response to Europe's problem of regional divergence.

Recognition of the diverse regional growth pattern is a necessary turning point in EU policy thinking, one that brings with it the realisation that there can be no return to the 'one size fits all' policies of the past. It had become obvious that the Commission had to address needs at the local level. One of the key turns in thinking as it evolved from the innovation policies of the 1980s was that innovation itself no longer depended only on how firms, universities, research institutes and regulators perform, but on how they work together. The notion of networking and collaboration was pride of place. Theory had begun to recognise this fact, along with the spatial constraints of networking the idea of creating robust networks on the regional level, where learning and adaptation were key to heralding the institutional turn in EU policy making.

Chapter two mapped out both sets of general theories that have informed EU policy making regarding development in the information age. In this chapter we have seen some results of the pursuit of a mechanistic approach to development. The neo-liberal, top-down approach that dominated EU thinking throughout much of the 1980s and

1990s has had many different results, more recently, negative ones. In terms of helping Europe compete on the world stage, they have all but failed, and in terms of developing a more coherent Union, they have done much worse. Divergence in regional living standards is very much on the increase throughout the Union. The pursuit of market-led and deterministic policies have made a major contribution to this trend.

Chapter four tests the alternative theoretical approach to development in the information age through the reality that is the Regional Information Society Initiative. RISI is used as a vehicle of analysis as it embodies the theoretical philosophies of the institutional school of thought. As was pointed out in the previous chapter, in some areas this approach to development almost diametrically opposes that of the determinists. In essence, the biological nature of placing people's demands first and building from the bottom-up can be seen as quite the opposite to the aforementioned mechanistic nature of emphasising the market, and relying on filtration from the top-down. Whether or not RISI and the institutional approach it implies will be the panacea of development woes in Europe may be too early to tell, but the next chapter attempts to evaluate its impact thus far by the use of various methods and means of analysis.

Map 3.1 Regional Disparities: GDP by region in Europe 2001

CHAPTER 4: THE REGIONAL INFORMATION SOCIETY INITIATIVE

Introduction:

This chapter seeks to examine in detail the nature of the European Commission's Regional Information Society Initiative (RISI). I use this initiative in particular for reasons referred to in the last chapter; namely, its innovativeness and how it has become demonstrative of the change in thinking of the Commission of its approach to the Information Society (IS). It is seen by some (see for example Morgan, 2001) as indicative of a shift in approach after the failure of previous supply-led policies that sought to bring Europe into the Information Age.

RISI, in a sense stands against those policies, by turning to the demand-side of the market and by creating demand for Information Society Technologies in Europe's less favoured regions. The collaborative nature of projects undertaken under the initiative can also be interpreted as a backlash against the liberal approach which relied so much on the 'top and trickle down' approach. RISI calls on the involvement of actors at the local level in the creation of the somewhat different 'bottom-up approach'.

Networking is seen as key to the initiative, emphasis is placed on collaboration of many different actors within the region in order to create a better understanding both of the different agendas of each actor and how the region itself can benefit from the development of an Information Society. Learning is seen as a key part of the initiative, and through networking it is thought that different members can learn from each others' experiences.

The 22 regions involved in RISI are diverse, and while the over-riding ethos of RISI remains the same for each, all have different interpretations about the type of IS they pursue. It can be viewed as an umbrella project in that it brings ongoing projects in the member regions together under one title. The adaptability of the initiative is another trait that sets it apart from other past initiatives that were imposed in a 'one size fits all' fashion. For this reason it has been heralded as a success by many of its participants, but

its somewhat loose approach has also bought criticism from others in relation to its disconnectedness.

This chapter will start out by exploring further the background to the initiative and the main beliefs and assumptions behind it before going on to look at its diverse number of participants. In looking at the 22 regions of RISI, I give a brief account of both the type of region and the effect that regional specificity has had on their respective RISI projects. Firstly, I will look at how the regions are classified according to Eurostats NUTS classification, then how they are classified by ERDF status, before looking at their degree of regional autonomy.

The chapter then goes into a socio-economic evaluation of the 22 regions in the context of Europe before going on to look at the degree of innovativeness of the regions. There then follows a statistical inquiry into the results listed in the previous sections, where the relative importance of each of the measures are weighted in the form of correlations. Results are explained before looking at the results from the surveys conducted with each of the 22 regions.

The final section deals with my two case study regions; the Midwest (Shannon) and the Southwest of Ireland, looking at both regions I compare and contrast both in terms of the other RISI regions as well as the remaining six Irish regions. Both regions, along with the rest of Ireland, have seen substantial gains in economic terms over the life-time of the initiative, and segregating the impact of RISI from that is difficult. Making use of interviews carried out in the regions in July and August of 2002 and the action plans and reports of the RISI projects in both provides a useful insight into the costs and benefits of the initiative.

In looking at RISI and its effects on both Irish regions I aim to gauge the success of choosing information technologies as a development path. Owing to the economic boom Ireland experienced in the 1990s, both RISI regions showed a unique development trajectory vis-à-vis the remaining 20 regions, the question that informs the following

chapters is has RISI and the approach it embodies changed the development path of Shannon and the Southwest vis-à-vis the rest of the Irish regions?

The RISI process

Since the early 1990s, there has been a growing interest amongst the advanced industrialised nations in the information society as a phenomenon which permeates every aspect of our lives, affecting every cell of society and every sector of activity. In the European context, this was first expressed in the Delors' White Paper (1993) and subsequently in the so-called Bangemann Report (1994) and Commission's Action Plan (1994). Since 1994, many reports and publications have focused on Europe's need to remain competitive in terms of the information society and, accordingly, the Commission has stimulated a number of related actions. In broad terms, these have not only been concerned with the infrastructure and technologies but also with the human and societal impacts. The RISI project commenced with the publication of a call for participation in late 1995 and, by mid-1996, 23 eligible (less favoured) regions had been selected. The individual regional initiatives (22 finally agreed contracts) commenced later that year or early in 1997 (see table 4.1).

Table 4.1 RISI Member Regions

Region	Project Name	Country
Steiermark	Telekis	Austria
Liege	Fasil	Belgium
Brandenburg	Bis2006	Germany
Bremen	Brise	Germany
Schleswig-Holstien	Infosh	Germany
Iperios	Rise	Greece
Attiki	Athina	Greece
Extremadura	Infodex	Spain
Murcia	Essimur	Spain
Poitou-Charentes	Serise	France
Midi-Pyrenees	Teleparc	France
Limousin	Acti-Limousin	France
North Karelia	Nocis	Finland
West Finland Alliance	Parradis	Finland
Midwest	ShiPP	Ireland
Southwest	STAND	Ireland
Calabria	Arianna	Italy
Blekinge	It-Blekinge	Sweden
Vasterbotten	Ac-Direkt	Sweden
North East	Nistrat	UK
Yorkshire and the Humber	Compris	UK
Wales	WIS	UK

(RISI, 1996)

The Commission's initiative was based in part on the success of the pre-pilot Inter-Regional Information society Initiative (IRISI) which had been launched in late-1994. The eligibility criteria for both RISI and IRISI required that regions should have Less Favoured Region (LFR) status in recognition of their need to catch up in terms of economic performance and social cohesion with their more prosperous counterparts and that the information society might provide a paradigm for such accelerated development. In part, however, it was also recognised that such regions needed to develop their strategic planning competence and development capability and the RISI project provided a vehicle to assist this.

The common approach adopted by the 22 RISI regions was based, to a considerable degree, on the lessons learned by the predecessor pilot projects and programme (IRISI). However, it is important to be clear that it was not the same approach as that adopted by the IRISI regions – the so-called IRISI methodology. As an exploratory pilot project, IRISI highlighted many difficulties and problems. Not least of these was the difficulty behind creating public-private partnerships on the regional level and persuading some institutions to re-orientate themselves. This coincided with some IRISI actions 'over-shooting the mark' in terms of inflating the demand for advanced ICTs in the LFRs. But, partly as a result of the evaluation process, a number of lessons were learned from which the RISI process benefited, such as the recognition of the catalytic role played by public funds in the stimulation of demand through the development of pilot applications and the development of new ICT applications (IRISI, 1998). An example of the difference was that the pilot regions had been expected to produce draft strategies and action plans within Phase One (5 months). By contrast, the RISI regions were expected to produce an "Options Paper" setting out possible scenarios as a basis for stimulating a region-wide debate on the way forward first, followed by the production of a strategy and action plan within an 18 month timescale. This adjustment to the methodology arose out of recognition of the sometimes unrealistic expectations placed on the IRISI regions.

Nonetheless, the IRISI experiment validated some basic underlying principles of the approach proposed by the Commission and these were further built upon with the RISI project. These fundamental principles included the following 'beliefs':

- That there was nothing deterministic about the shift to the Information Society; that the technological, economic and societal changes associated with ICTs and the Information Society were not wholly exogenous but could be influenced by *societal choice*. In other words, regions could influence how information and communications technologies would impact on their regions through the development of strategies and action plans and their subsequent implementation. Of course, in a global economy driven by technological and other changes, it

was recognised that some changes are inexorable and regions (along with other organisational entities) cannot wholly control the process of transformation. But, they can influence it.

- That, in order to shape the forthcoming Information Society at the regional level so as to ensure its benefits would be maximised and the risks minimised, it was necessary to engage in an explicit *planning* process and this should, in turn, be based on a widespread *public debate*.
- That a desirable outcome was an Information Society that facilitates and promotes *consensus* and social harmony rather than division and conflict (RISI, 1998).

From the above 'beliefs' it was already becoming obvious that there was something different about RISI, and that new words had begun to enter the vocabulary of the European Commission. 'Societal choice', 'debate' and 'consensus' had replaced earlier terms of popular usage, such as 'market-driven' frequently used in earlier programmes. These new principles found expression in a range of activities and actions that underpinned the common approach adopted by the RISI regions. These were as follows:

- Each regional initiative was to develop a policy response (strategy and action plan) that was responsive to the needs of the region's organisations and citizens. The development of such a response thus needed to be essentially *bottom-up*;
- Since responses to the challenges posed by the Information Society will affect all sectors of society, the approach needed to be *inclusive*, engaging the participation of representatives of all social groups as well as the key economic players;
- It is an *evolutionary* process - there are no 'correct' answers; regions must 'learn by doing';
- The action should seek to build *partnerships*, establish a *consensus* and secure the commitment of key actors to long-term visions, medium-term strategies and short-term priorities for the development of the Information Society in each region;

- Partnership and consensus would be achieved through stimulation of a wide *public debate* and the development of new forms of *networking* within the region;
- The process of awareness raising, partnership formation and consensus building would bring about organisational *learning* and *change* in support of the strategy and action plan;
- The resulting consensus behind priorities for action would be developed in the context of, and integrated with, *regional development* policy;
- By adopting a common approach, the RISI regions would benefit from inter-regional networking and *mutual learning* and, through the exchange of good practice, enhance regional development capacity and competence.

  (RISI, 1998)

Here again we see a significant shift in emphasis with terms like 'bottom-up', 'partnership', and networking' replacing terms such as 'top-down', 'leader' and 'market rules' which were abundant in many of the earlier Commission initiatives. In practical terms, the approach proposed by the Commission called on each of the member regions to follow a common agenda which was then tailored to the region's specific needs and given a unique project name (see table 4.1).

What was first required of the regions was to carry out a baseline audit of existing and planned ICT infrastructure and services, essentially highlighting their propensity to succeed in the IS. This was followed by a benchmarking exercise, something that has proliferated throughout many EU programmes since RISI. The first action to be taken by any region was to be the *Awareness Raising* campaign to stimulate public participation and debate. *Options Papers* were then to be completed to map out the possible scenarios for each region/project before the creation of appropriate *networks and partnerships* to facilitate, broaden and deepen participation in the debate. The development of a *Strategy and Action Plan* was seen by the Commission as an important step in establishing the priorities for the regions. The next step was to carry out negotiations with regional authorities to integrate the Information Society action plan within the wider regional

development plan, giving the IS a more concrete position on the regional agenda. The final phases were to begin pilot ICT applications and to implement suitable mechanisms to monitor and evaluate selected projects.

In contractual terms, the Commission's approach, recognising the difficulties, complexities, and disparate nature of the participating regions, was not prescriptive but set as the principal objective:

> *"To survey the current status of the Information Society in the region, and formulate a strategy and action plan to expand knowledge and exploitation of it, for the greatest common good of the region and its population"(RISI, 1998 pp.9)*

This was to be achieved (in terms of a minimal set of contractual deliverables) by establishing a comprehensive '*inventory*' of the existing Information Society situation in each region. Given the pace of change, it was suggested that this needed to be done periodically. The end goal was to create an *action plan* which translated strategy into tactics and specific measures for achieving the growth of the Information Society.

As a precursor to their activities, each regional initiative was expected to put in place effective arrangements for the management of the initiative based on the Commission's guidelines. These proposed the establishment of a *Regional Steering Committee* representing the key regional players: i.e. Regional Authorities, telecommunication actors, productive forces and users. Second was the creation of a *Management Unit* to support the Steering Committee and carry out its decisions (ideally 4-5 people with executive skills). The third measure was the setting up a range of *Working Groups*, as a means both of tapping into the region's pool of expertise and of broadening participation in the initiative.

These organisational mechanisms were seen as the 'motors' of the initiative that would drive it forward and ensure that its objectives were met successfully. As emphasised, the

various actions and activities associated with developing a Regional Information Society Initiative (RISI) were both complex and inter-dependent. Making sense of this complexity was a major issue for the management of such regional initiatives. However, every project or initiative needed a start point and an end point, and so as to make sense of the complexity, actions for building a regional Information Society strategy were classified into three groups of activity:

- Research, Analysis, Assessment & Monitoring;
- Social & Organisational Interaction & Engineering;
- Choice, Collective Action & Implementation.

The *raison d'être* of RISI was in the process as well as in the outcomes. This meant that the analysis phase - assessing a region's current Information Society status and capabilities, and its current and future needs were vital. This phase should then be followed by the making of informed choices, via a consultation process, as to the actions to take in order to have the best chance of satisfying those needs. These two preparatory stages were seen as fundamental and critical. Action was thought to be most likely to result in success when it is based on solid analysis.

As the following section will make clear, the RISI regions are a grouping of 22 heterogeneous regions, differing in size and wealth, but for the most part with one thing in common; their living standards were below that of the European average. The heterogeneity of the regions is displayed in the different aims and goals of the 22 projects under the one initiative. So while the Schleswig-Holstien region in Germany aimed:
"To develop a coherent strategy and action plan for the building of the IS in the region, by organising broad based dialogues within the region, exchanging knowledge with other regions and help develop the cultural identity of the region" (InfoSH, 1998,pp.ii)

The Epirus region of Northern Greece aimed:

"To exploit opportunities offered by the IS in view of the recent changes in the region such as the opening of the Albanian borders, and the development of economic links" (RISE, 1998, pp.4)

Similarly, the region of Vasterbotten in Finland has as one of its objectives to catch up with the national average in terms of embracing the IS, while the Attica region in Greece plans to lead the nation into the IS. Thus the 22 strategy and action plans were each tailored to the regions' needs with the more rural regions having differing objectives to the more urbanised ones. While this does lead to difficulties in comparing the effects that each project has had on the region, it also puts RISI in the propitious position of being one of the first pan-EU initiatives that pays significant attention to the differences of place. The design of the initiative was such that each project was region specific and RISI, therefore, did not make the mistake of past initiatives in assuming that the geography of the EU is uniform.

Steering Committees in each project are also specific to the regions' needs. All regions have a representative of the regional government/development agency that represents the region, while most steering committees also comprise of representatives from the region's Universities/Institutes of higher education. The differences between steering committees in the regions usually accounted for representatives of the regions biggest employers, such as agricultural and tourist representatives. Not surprisingly the Working Groups and Pilot Action areas also differed by region. However, there is a high degree of commonality between regions of the same nation with regards the pilot actions they pursued. One reason for this is that many shared pilot actions with their neighbouring regions e.g. ShiPP and STAND (Midwest and Southwest Ireland) collaborating on TITAN, a telematics project focusing on the provision of public services and ASPECT, a spatial planning project with participants from all three of the UK RISI regions.

The RISI members' opinions on the Initiative in its build up stage are quite consistent. My survey results show that 80% of respondents thought that RISI's benefits outweighed its costs in terms of drawing up audits and action plans. With regards to the operational

phases of the programmes such as pilot actions, all members saw the pilot actions as the most useful parts of the projects. The least favourite part of the project was considered by many to be the forming of the Steering Committees, respondents placing the blame on a dominating few ruling the whole.

As the next section attempts to make clear there are differences that exist between regions involved in the same initiative. While this does make for a greater degree of disparity between projects, it can also be seen as one of the main benefits of the initiative. In comparing and contrasting the different RISI projects of the two case study regions (Midwest and Southwest) I shall explore such differences in greater detail later on. As already mentioned there are some traits that the projects have in common, many of which are laid down by the RISI guidelines; the effects of the commonality across the different regions will also be investigated. However, the over-arching bond that ties all 22 regions together in this initiative is their label as Europe's less favoured and the belief that 'embracing the Information Society' is the best way to combat it. As mentioned in the opening chapter it is the aim of this work to test whether this belief can become a reality for Europe's peripheral regions.

The Socio-economic background of RISI regions

Classification of the regions

The most common trait among the RISI regions is their differences; in highlighting these I will employ classifications already set out by the European Commission. The first of these is differentiating regions according to scale. Eurostat uses a specific classification system to divide the European regions on different geo-economic levels: the "Nomenclature of Territorial Units for Statistics" (NUTS). The nomenclature of territorial units for statistics was drawn up by Eurostat to be a single, cohesive system of territorial groupings for the compilation of EU regional statistics. The NUTS nomenclature subdivides the economic territory of the EU into 77 regions at NUTS level

1, 206 regions at NUTS level 2 and 1,031 regions at NUTS level 3. Each NUTS category indicates a different scale, with 1 being the largest and three the smallest. For the most part NUTS 2 regions comprise of NUTS 3 regions and NUTS 1 regions comprise of both NUTS 2 and 3 regions. Taking Ireland as an example, the country is considered as a NUTS 1 region, which comprises the two NUTS 2 regions, Border Midlands and West, and the Southern and Eastern regions. These in turn are made up of the NUTS 3 regions. Data for the latter set of regions is much harder to obtain on an EU level as Eurostat publishes most of its work on the NUTS 1 and 2 scales.

As table 4.2 points out most RISI member regions are either NUTS 1 or 2 with 5 classified as NUTS 3 and one region not recorded by Eurostat. This gives us a quick indication of the differences that exists between the regions on a purely spatial scale. The largest RISI region is the West Finland Alliance (not measured by NUTS), it is a federation of five separate Finnish regions, and it covers in 64,000 sq. km. According to the NUTS classification, Västerbotten in Northern Sweden is the largest region. It covers an area of over 55,000 sq. km. The smallest RISI region by far is Bremen, the city-state in the north of Germany with a size of only 400 sq. km

Table 4.2 Classification of the RISI regions

Region	Country	NUTS Classification	Objective status	Regional Autonomy proxy
Steiermark	Austria	2	2 and 5b	B
Liege	Belgium	2	2	A
Brandenburg	Germany	1	1	A
Bremen	Germany	1	2	A
Schleswig-Holstien	Germany	1	5b	A
Iperios	Greece	2	1	C
Attiki	Greece	1	1	C
Extremadura	Spain	2	1	B
Murcia	Spain	2	1	B
Poitou-Charentes	France	2	5b	A
Midi-Pyrenees	France	2	5b	A
Limousin	France	2	5b	A
North Karelia	Finland	3	2	C
West Finland Alliance[1]	Finland	n/a	2 and 5b	C
Midwest	Ireland	3	1	C
Southwest	Ireland	3	1	C
Calabria	Italy	2	1	B
Blekinge	Sweden	3	2	C
Vasterbotten	Sweden	3	1	C
North East	UK	1	2 and 5b	C
Yorkshire and the Humber	UK	1	2 and 5b	C
Wales	UK	1	1	B

Source: European Commission, 2000; RISI, 1998

The fourth column in table 4.2 lists the Objective Status of the 22 RISI regions on their commencement of the initiative. The 1988 reform to EU regional policy (CEC, 1988)

[1] The West Finland Alliance is a federation of 5 Finnish regions, which are partly not congruent with the NUTS classification, so that Eurostat provides no data for this territorial unit. Data for the WFA could however be partly gathered from the questionnaire.

assigned a number of specific objectives to the Structural Funds, to which they would be either jointly or separately assigned, as follows:

Objective 1: Development of structurally backward regions (ERDF, ESF, EAGGF)

Objective 2: Converting regions in industrial decline (ERDF, ESF)

Objective 3: Combating long-term employment (ESF)

Objective 4: Increasing youth employment (ESF)

Objective 5 (a): Adjustment of agricultural structures (EAGGF)

Objective 5(b): Development of rural areas (EAGGF, ERDF, ESF).

The 1993 Maastricht Treaty on European Union upgraded the importance of EC regional policy, with the Treaty establishing economic and social cohesion as one of the pillars of the Community structure, and agreement being reached to set up a new 'Cohesion Fund' for the poorer Member States. Reflecting these developments, the Structural Fund budget was increased from approximately 43.8 Billion euro over the 1988-1993 period to over 141 billion euro for 1994-1999 (at 1992 prices).

The amendments made to the operation of the Structural Funds during the second reform were fairly minimal. The main changes concerned eligibility criteria, programming periods and administrative procedures. The Objective 1 regions for 1994-1999 were set out in the 1994 Structural Fund Regulations, while areas eligible under Objectives 2 and 5b were chosen on the basis of proposals submitted by Member States (rather than unilaterally by the Commission, as previously). The Regulations continued to be based on the same principles contained in the 1988 Regulation, that is planning, partnership, additionality, compatibility, concentration and co- ordination (Michie and Fitzgerald, 1997).

Table 4.3 Objectives, allocated Structural Funds and eligibility criteria

Objective	*Support Available from*	*Eligibility Criteria*
Objective 1	ERDF, ESF, EAGGF	Regions at NUTS level II with GDP per head less than 75% of the Community average or regions included as special cases
Objective 2	ERDF, ESF	Regions at NUTS level III with: - higher than average unemployment the last three years - industrial employment as percentage of employment above Community average the last 15 years - an observable fall in industrial employment relative to reference year or substantial job losses in specific industries
Objective 3	ESF	Not regionally restricted
Objective 4	ESF	Not regionally restricted
Objective 5a	EAGGF	Not regionally restricted
Objective 5b	EAGGF, ESF, ERDF	Regions With: - high share of agriculture employment - low level of agricultural income - low-level of socio-economic development - other factors like de-population, peripherality, size of holdings

At the outset of RISI Objective 1 regions covered over a quarter of the EU population (26.6%) and included the entire territories of Greece, Ireland and Portugal, together with most of Spain, much of Italy and all of the east German Lander. In addition, Objective 1 included parts of more prosperous Member States, notably Hainault in Belgium and Flevoland in the Netherlands. The basic eligibility criterion for Objective 1 was, and remains, that per capita GDP should be less than 75 per cent of the EU average. However, this requirement has been applied with considerable flexibility and there are a number of objective regions which do not fulfil this criterion (Cooke and Morgan, 1998).

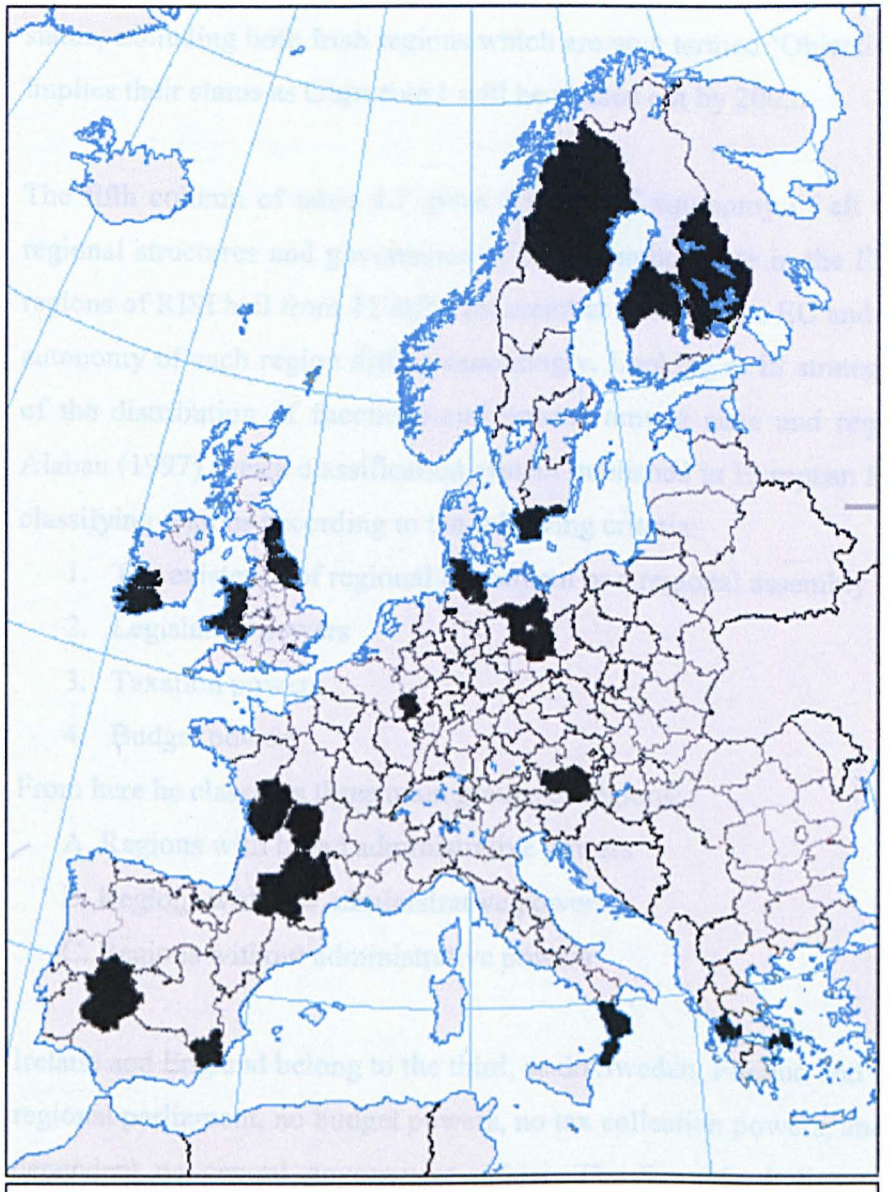
Objective 2 regions covered around one-sixth of the EU (16.6%) and included parts of all the Member States except Greece, Ireland and Portugal. Objective 2 designation is based on the NUTS 3 region and the criteria are primarily concerned with levels of unemployment resulting from industrial decline. Unlike the other three spatially-restricted objectives which were designated for the period 1994-1999, Objective 2 areas were initially designated only until the end of 1996.

Objective 5b covered under one-tenth of the EU (8.2%) and again includes parts of all the Member States except for the three Objective 1 countries. The primary criterion for Objective 5b designation was a low level of socio-economic development as measured by GDP per capita. In addition, designation depended on one of the following: a high level of agricultural employment, a low level of agricultural income or demographic disadvantage.

Table 4.2 shows the Objective funding status of the RISI regions, map 4.1 shows their location in Europe. With nearly half of the regions classified as Objective 1, a clear picture begins to emerge as to the types of regions. The geography behind the Objective status is evident with all Objective 1 regions lying on the periphery of the Union. There were four regions in each of the other Objective categories, those in Industrial decline, included the city-state of Bremen. All three French regions were Objective5b, demonstrating their dependence on agriculture. The two English regions were categorised

as both Objective 2 and 5b. The differences in Objective status of the RISI regions is another indicator of their heterogeneity

Map 4.1 The RISI Regions



Source: Adopted from European Commission (2004)

On the whole objective status of the regions has changed little since the start of the initiative. A new round of Objective funding saw all Objective 1 RISI regions retain their status, excluding both Irish regions which are now termed 'Objective 1 in transition', this implies their status as Objective 1 will be phased out by 2005.

The fifth column of table 4.2 gives a proxy of autonomy of all the RISI regions. The regional structures and governance of each member state in the EU is different. The 22 regions of RISI hail from 11 different member states of the EU and the degree of regional autonomy of each region differs accordingly. Looking at IS strategies must take account of the distribution of functions and powers among state and regional administrations. Alabau (1997) uses a classification system published in European Parliament documents, classifying regions according to the following criteria:

1. The existence of regional Parliament or a regional assembly
2. Legislative powers
3. Taxation powers
4. Budget powers

From here he classifies three main groups of regions:

A. Regions with broad administrative powers

B. Regions with low administrative powers

C. Regions without administrative powers

Ireland and England belong to the third, as do Sweden, Finland and Greece. They have no regional parliament, no budget powers, no tax collection powers, and financing is entirely dependent on central government affairs. The Spanish, Italian, and Austrian regions belong to the second categories and thereby have some administrative powers including budget and taxation powers. The German, French and Belgian regions belong to the first categories and thereby have their own regional assembly and are near full autonomy from the centralised state. The autonomy of the regions was calculated at the beginning of RISI,

over the course of the intermittent years only one significant change has occurred; the devolution of power and the formation of the Welsh regional assembly in Cardiff.

Here again, using simple classifications of the RISI regions show the differences that lie between them. In all classifications, from spatial scale to Objective status to autonomy there are differences between the 22 regions. As the next section will demonstrate this had implications for each region's pursuit of the IS. Different projects and pilot actions have been put in place in regions of different size, economic make up and degrees of regional governance. As already mentioned, it is the looseness of the RISI that has made it stand out from others before it. But what it has in common with many EU IS initiatives is the belief that embracing the IS can actually change the development trajectory of a region regardless of its geography. The next section looks more closely at the differences in the geography of the 22 regions and tests whether the IS can prove to be the panacea of EU regional ills.

A General Overview of the 22 RISI regions

Table 4.4 RISI regional overview

Region	Pop (000s) 1996	GDP/pps[2] 1996	Unemployment rate 1996	Highest Educational Attainment[3]
Liege	1019	88.7	13	26.5
Brandenburg	2600	72	15.3	29.8
Bremen	661	144.8	11.4	20.3
Schleswig-Holstien	2782	105.1	6.6	21.2
Epirus	376	43	11.2	16
Attiki	3456	75.7	11.9	22.6
Extremadura	1074	49.3	30.5	17.2
Murcia	1125	65.2	24.5	22.6
Poitou-Charentes	1651	86.1	11.3	18
Midi-Pyrenees	2576	91.4	11.1	27.3
Limousin	711	84.1	9.6	18.4
Midwest	470	86	9	20
Southwest	560	94	11.7	20
Calabria	2040	61.2	25	10.7
Steiermark	1202	92	5.1	12.7
North Karelia	684	75.2	19.2	27.9
West Finland Alliance	705	82	14.6	30.8
Blekinge	1278	96.5	9.8	27
Vasterbotten	511	105.6	9.7	23.8
Noth East	2596	79.9	10.6	22.6
Yorkshire and the Humber	5072	84.9	8.9	25
Wales	2958	80.8	8.5	26.2

Again table 4.4 reiterates the heterogeneity of these 22 regions. In population terms the largest is Yorkshire and Humberside (UK) which accounts for over five million, comparing that to the Greek region (Epirus) which has just over one-third of a million residents and it becomes obvious that respective projects work on completely different scales. For example, in the Epirus region one of the main objectives regarding infrastructure is:

[2] PPS refers to purchasing power standard, this indicator uses the same basket of goods purchased in each country/region to compare purchasing power differences between them.
[3] Highest Educational Attainment refers to the percentage of the population having completed tertiary level education.

> "To bring together all the key regional actors to lobby the telecommunications provider for the provision of a sustainable and competitive communications infrastructure" (RISE, p.15)

The concerns of the UK region in terms of infrastructure provision are somewhat different.

> "ComPris needs to push for more open competition in the telecommunications market" (ComPris Conference, October, 2000).

Population and the density of the population of the RISI regions as can be seen from the above quotes have a great deal of influence on the type of project pursued and therefore the type of IS that can be adopted in the respective region. Simple economics govern the extent of telecoms service provision in each of the 22 regions, those with lower population densities are the regions with the poorest infrastructures often at the highest prices (see Chapter 7).

As a criterion of RISI, a region must be considered as less favoured. Column 3 in table 4.4 shows that in terms of GDP per capita in Purchasing Power Standards (purchasing power parity rates are based on the prices of a particular list of products in each region) most regions were well below the EU average. The notable exceptions being the German regions Bremen and Schleswig-Holstien, at 44% and 5% above the EU average respectively. Again the gap between the highest and lowest on this classification is appreciable with the Greek region Epirus and Spanish region Extremadura under half the EU average. The general trend in terms of GDP in RISI regions, mimics the EU wide trend of a north-south division. So regions furthest behind the EU average are those from the Southern EU countries of Spain, Greece and Italy.

Not surprisingly a similar trend is shown in the fourth column which lists the unemployment rates for the RISI regions in 1996. Here the Spanish regions stand out with over one-quarter of the workforce in both regions seeking employment. The Austrian region, Steiermark and Schleswig-Holstein in Germany have the lowest unemployment figures.

Again, both GDP and unemployment rates have a great deal of influence on the types of IS projects pursued in each of the regions. Most of the 22 projects list 'economic benefits' as one of the key drivers in pursuing the IS:

> "embracing the IS will enable us to exploit more opportunities for the economic benefit of the region" (Essimur - Murcia, 1996 p. 34)
> "Promotion and development of the IS via stimulating ICT related projects which contribute to the economic development of the region" (Nistrat - Northeast, 1996 p. 12)

Employment also rates highly on action plans in RISI projects. Statements about inclusion and social cohesion are liberally scattered throughout most project proposals: "The challenge is to prevent exclusion, support regional competitiveness and create new jobs, making North Karelia a more cohesive region" (NOKIS, 1996, p. ii). A greater deal of emphasis is placed on job creation among the Southern regions, where unemployment has had a crippling effect on the regional and national economies.

But projects can also be divided by those who place a greater emphasis on the social aspect of the IS. Social inclusion seems to be higher on the agenda in the better-off regions of the north than those of the south. The difference is understandable, as regions with high unemployment and low GDP have different priorities than those in a more privileged position. Regions such as Bremen in Germany can afford to concentrate on an IS project that will pursue an information society where:

> "an integrated concept of the IS will be achieved through developing strategies and action for the best possible use of ICTs. By ensuring the participation of all citizens we can bring about a cultural transformation that shall be consensual and inclusive" (BRISE - Bremen, 1996 p. 45).

With its relative wealth and the degree of autonomy of this city-state, it can afford to pursue such lofty goals in embracing an information society.

The final column in figure 4.4 lists the percentage of each region's people who have attained a qualification at tertiary level education. This will be dealt with in greater detail in the next section in testing the innovativeness of the RISI regions. For now looking at this indicator we again see that it both varies from region to region and has some influence on the region's choice of IS project. Being one of the fundamental tenets of RISI; all regions espouse the view that learning is important. There are, however, many different ways of promoting it. Not surprisingly regions with a higher percentage in this education index tend to place universities and institutes of higher education at the centre of the project:

> "Intensive co-operation in the area of education and training between the universities will be centre place in our IS strategy. As institutions we feel that their role in disseminating knowledge in the information society will be paramount." (PARADDIS - West Finland Alliance, 1996, p. iv)

A different perspective is taken by the French region Limousin:

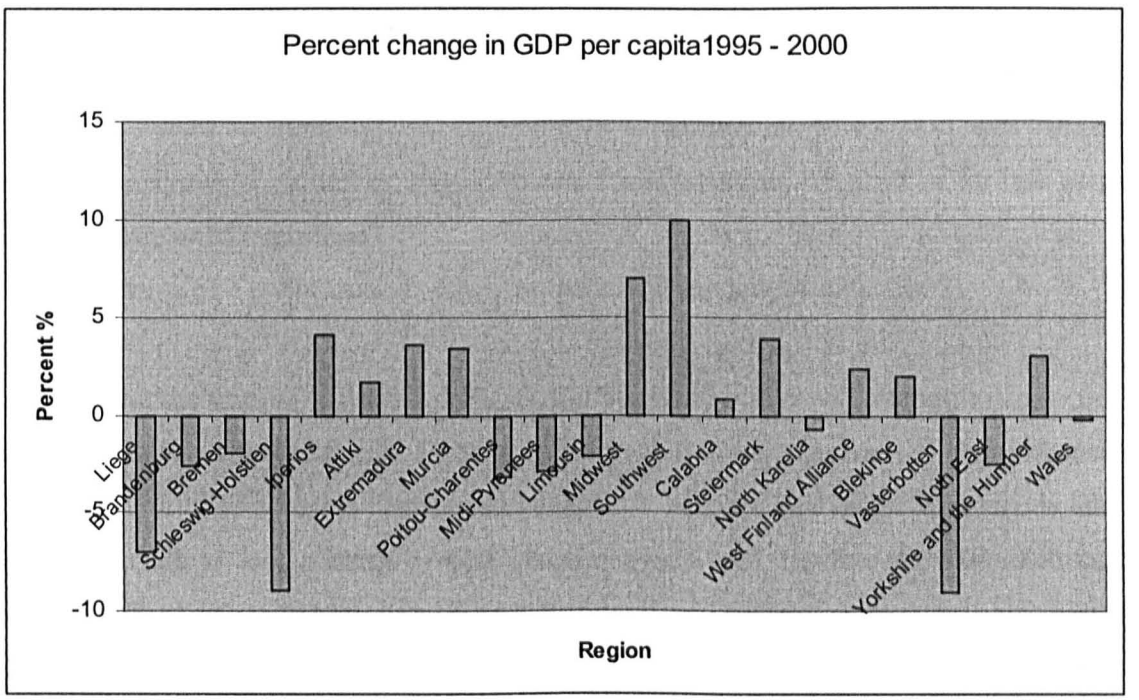
> "To bring the IS to the people we feel that informal workshops in public centres across the region is the best approach. One pilot action we are pursuing is signing as many citizens as possible up to the European Computer Driving Licence (ECDL), which will be held in schools across the region" (Survey response, August 2002 - Limousin)

Education and the importance placed on it within the region is a determining factor in how each region conceives of the IS and how they choose to pursue it. As a fundamental tenet of RISI, education warrants further attention, which will be given in the next section. Theories on the information society more generally also place a great deal of emphasis on education and learning, and especially how they contribute to innovation, one of the key pillars in the IS.

Looking at change over time we see some RISI regions improve their position in terms of GDP and unemployment while others have done the opposite. GDP per captia proves useful for analysis as figures are available to compare the regions' well-being before and

after RISI. In total the change across the 22 regions is not significant, but when we look at the regions individually we see that half the regions are better off then they were before the initiative. As figure 4.1 makes clear the remainder were in fact worse off.

Figure 4.1 Change in GDP per capita 1995 - 2000



Source: RISI handbook, 2001

Those regions with the most marked decrease were Schleswig-Holstien and Vasterbotten, the remaining German regions also registered a decline over the time period. On the positive side, the less well off RISI regions in both Spain and Greece registered an increase, which lead to an overall lessening of the gap between the richer and poorer regions in RISI. The clearest 'winning' RISI regions were the two Irish regions which rose 7.2 and 10 points in terms of the EU average over the 5 years.

Looking at changes in regional GDP over the time period of the programme as a way of evaluating RISI would be short-sighted. There is little doubt that many more factors contributed to increasing or decreases a member region's wealth. Most all members claim that RISI has had a positive economic effect, but opinions vary both across and within regions:

> "I think you can look at this region now and compare it to what it was like before RISI, and you could say 'yeah, RISI has made a difference'. I mean just look at the influx of software companies into this region, I am not sure that would have happened without RISI"

Representative of Shannon Development - Shannon region (Interview, August 2002)

> "To say that any one thing has bought about an increase in economic fortunes for this region would be short sighted, bordering on sensationalist. The fact is, and for most of these types of initiatives; any economic transformation, for good or for bad would have happened regardless"

Representative of Town Council - Shannon region (Interview, August 2002)

Singling out the impact of RISI is difficult, but the next section will attempt to do so from a quantitative approach by looking at innovativeness; a more comprehensive quantification of IS assets is continued in chapter 8. A more qualitative approach is taken in the second to last section of this chapter which will involve an examination of questionnaires completed by members of the initiative. The final section will give a more in-depth analysis of the outcomes of RISI as I concentrate on my two case study regions.

The Innovativeness of RISI regions in Europe

There have been major efforts in the field of innovation indicator development over the past decade, efforts driven both by policy concerns and by theorists and analysts. From the policy side there has been an increasing understanding and awareness of the economic importance of innovation, and a tighter linkage between innovation policy and wider policy objectives. From the theoretical or analytical side, the study of the characteristics and impacts of innovation began to accelerate nearly thirty years ago and has now become a major research area for economic analysis and general social theory. These combined impulses have led researchers and institutions to seek to develop better quantitative indicators for innovation.

The generally available data for innovation and technology analysis is essentially of four types. Firstly, there is data on R&D inputs, collected in the OECD economies according to the procedures and categories described in the "Frascati Manual"(OECD, 1981). Secondly, there is patent data, the most important body of which consists of the records of the US Patent Office and the European Patent Office. Thirdly, there is bibliometric data on patterns of scientific publication and citation. Finally, there are various new types of data seeking to directly measure or indicate innovation processes across sectors: their inputs, outputs, objectives and so on. In addition to these major sources, there exists a wide range of what we might call 'ad hoc' data sources, constructed usually by researchers to explore specific research issues.

The fact that these data sources have limitations is well known. R&D numbers measure only an input, which has no necessary relation to innovation outcomes. There are many examples of successful innovating companies which perform relatively little R&D. Patent data is limited by variations in firms' and industries' propensity to patent; moreover it tells us only about the invention phase of the innovation process, and little about commercialisation and hence the economic value or economic impact of an invention. It may also be, as Keith Pavitt has argued, that R&D data underestimates the amount of innovative activity in small firms, while patent data underestimates innovation in large firms (Pavitt, 1982). Bibliometric data tells us much about the changing shape of fundamental research, but little about the innovation process. Innovation data faces basic challenges in capturing all aspects of the novelty, learning and change which are involved in innovation.

The policy need for new innovation/knowledge indicators is based on recognition of the vital role of innovation in modem economies. This has sharply increased the importance of R&D and innovation policy. An especially important development is the increasing acceptance of the idea that we are entering a new type of 'knowledge economy'. However this goal grew substantially in importance in the early 1990s as major

institutions such as the OECD and the European Commission began the process of defining innovation indicators, and coordinating their implementation across countries. These initiatives led, for example, to the OECD's *Oslo Manual*, first published in 1992 and revised in 1997, which attempted to provide theoretical and methodological foundations and guidelines for new innovation indicators, and to the *Community Innovation Survey*, funded by the European Commission via Eurostat, and implemented in 1992-93, and again in 1997-98. The latter exercise has involved data collection from a very substantial number of firms: more than 40,000 in the first round, and around 100,000 in the second round.

In September 2000, the *European Innovation Scoreboard* (EIS) was developed at the request of the Lisbon European Council[4]. The 17 main indicators of the EIS focused on high-tech innovation and provided indicators for tracking the EU's progress towards the Lisbon goal of becoming the most competitive and dynamic knowledge-based economy in the world over the first decade of the 21st century.

The EIS proves valuable to this study because of its expansion in 2002 with the creation of the Regional Innovation Scoreboard. The Commission identified two main reasons why regional level data are of value. Firstly, European and National innovation policies are often developed and implemented at the regional level. Secondly, the Commission has recognised the spatial dimension behind innovative activity, which can be dense in one cluster of activity and virtually non-existent in a neighbouring region.

Table 4.5 below gives a comprehensive overview of the main indicators of innovation in all the 22 RISI regions. *Life-long Learning,* is recognised as one of the key factors in the creation of a competitive region in the information age. As with many of the regional indicators, they are greatly influenced by national ones. The *Medium/high-tech employment in manufacturing* score acts as a proxy for the number of high-value added

[4] The first full version of the EIS was published in October 2001: SEC(2001) 1414.

workers in industry across the region. The automobile industry explains to a large extent the ranking of the top EU regions: e.g. Piemonte (rank 3, Fiat), Bayern, (rank 4, BMW), Comunidad Foral de Navarra (rank 6, Volkswagen). The RISI region Bremen ranks the highest of the 22 most likely due to the presence of Daimler-Benz.

The picture is appreciably different for *High-tech employment in services*. With little relation to the last indicator the regions which dominate here are those that include the Union's largest Central Business Districts. *Public Expenditure on R&D* gives us a better indication of how well assisted regions are in the promotion of research and development through public monies; it is seen as a good indicator of the presence of voluntary policies directed to specific regions. *Business expenditures on R&D* provide a better indicator of the private sector and are a good pointer to the regions where high-value added innovative work is ongoing. The final indicator, *high tech patents,* together with those that went before make for a more comprehensive picture of the innovativeness of the RISI regions.

Table 4.5. Innovation Indicators of RISI regions (2003)

Region	Percentage in Tertiary Education (%)	Percentage in Lifelong Learning (%)	Medium/high-tech employment in manufacturing (%)	High-tech employment in services (%)
Steiermark	12.29	6.02	7.05	1.99
Liege	19.25	5.13	4.85	3.14
Brandenburg	32.29	5.15	4.58	2.32
Bremen	19.53	6.37	9.02	3.03
Schleswig-Holstein	21.47	4.87	8.17	2.97
Epirus	14.43	0.61		
Attiki	21.46	1.96	3.56	2.43
Extremadura	15.52	3.27		0.95
Murcia	21.08	5.05	1.97	1.05
Poitou-Charentes	17.49	1.84	5.46	2.73
Midi-Pyrenees	26.07	3.53	6.88	5.11
Limousin	17.01	2.82	4.38	3.18
North Karelia	28.87	17.6	4	2.58
West Finland Alliance	34.01	22.69	7.83	2.99
Midwest	23.66		6.97	4.04
Southwest	24.32		7.01	4.47
Calabria	10.21	5.09	1.21	2.54
Blekinge	29.21	23.95	7.49	4.58
Vasterbotten	20.05	17.25	4.08	4.07
North East	22.35	19.29	9.45	3.34
Yorkshire and the Humber	26.22	21.58	6.25	3.19
Wales	25.62	18.27	8	2.91

Table 4.5 Continued

Region	Public R&D (% of GDP)	Business R&D (% of GDP)	High-tech patent applications	GDP per capita (€)	Revealed National Summary Innovation Index (RNSII)	RRSII (EU average = 100)
Steiermark			5	18237	0.77	69
Liege		1.15	6.9	15329	0.74	70
Brandenburg	0.89	0.6	9.3	15412	0.77	79
Bremen	1.05	1.02	7.5	31237	0.88	91
Schleswig-Holstein	0.64	0.44	10.8	22167	0.72	79
Epirus	0.62	0.07	0	6546	0.89	62
Attiki	0.45	0.23	1.4	11527	1.39	93
Extremadura	0.36	0.07	0	8250	0.56	48
Murcia	0.36	0.21	0	11055	0.69	58
Poitou-Charentes	0.34	0.42	2.4	17476	0.53	52
Midi-Pyrenees	2.04	1.66	14.6	19263	1.31	131
Limousin	0.21	0.53	1.4	17485	0.56	52
North Karelia	0.75	0.54	4.3	16478	0.58	75
West Finland Alliance	0.46	1.27	9.9	18389	0.77	100
Midwest	0.38	1.01	10.3	20859	0.79	99
Southwest	0.62	0.99	11.5	21658	1.05	103
Calabria	0.26	0	0	9983	0.6	50
Blekinge		2.81	48	21662	0.98	143
Vasterbotten		0.89	42.5	23046	0.66	97
North East	0.37	0.62	2.7	16451	0.71	84
Yorkshire and the Humber	0.44	0.45	2.8	18561	0.68	82
Wales	0.48	0.38	6.1	18065	0.7	82

Source: European Regional Innovation Scoreboards

As we have seen innovation is the creative process that transforms technology and new discoveries and processes into commercial value. The revealed regional summary innovation index, RRSII (see technical annex at the end of chapter for derivation) tries to locate *local* leaders in innovation within each region by taking into account both the region's relative performance within the EU and the region's relative performance within the country. This index is analogous to a location quotient for innovation by each region. Identifying local leaders reduces the influence of those indicators for which a country has

an above average performance. For the indicator of life-long learning, both the UK and Sweden show a value about 2.5 times above the EU mean. In calculating the RRSII, this indicator only weighs about 1.7 times the EU mean. Peaks for indicators for which the country performs well above the EU mean are thus adjusted downwards, peaks for indicators for which the country performs well below the EU mean are thus adjusted upwards. The RRSII will thus increase the composite indicator value for leading regions in lagging countries: local leaders become more visible.

For the EU as a whole, Stockholm is the leading region according to this index, followed by Uusimaa (Finland) and Noord-Brabant (Netherlands). The appearance of Comunidad De Madrid at rank 9 is a clear example of a local leader within a lagging country. Nine Southern EU regions can be found in the bottom 10 of the regions for which their RRSII has been calculated.

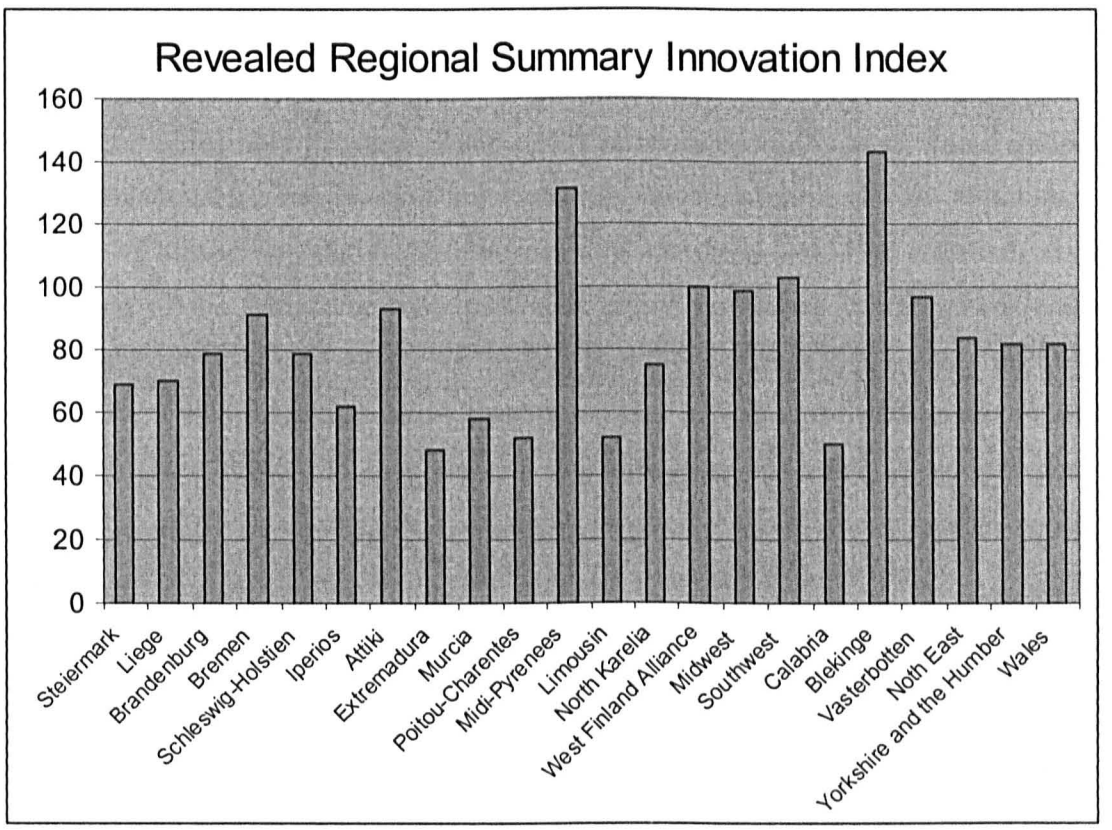
From figure 4.2 we see that amongst the RISI regions Blekinge stands out ahead of the other 21 regions with a score of 143. Following Blekinge is Midi-Pyrennes, in second place the region shows evident benefits of a healthy regime of expenditure on R&D from both the public and private sector. Both Irish regions follow with respectable scores around the 100 mark, as does the West Finland Alliance. As was the trend for EU regions on the whole, so it is for the RISI regions, with the lowest innovation scores coming out of the southern regions, most notably, Limousin, Calabria and both of the Spanish regions.

Although comparative figures for before RISI are not available, it can be seen from the innovation leaders', Blekinge and Midi Pyrenees, that innovation was important in both regions. 'The key is to move the high-value added work down through all industries and RISI will help us do that' (Telepark, 1996). In the Irish regions, information on innovation prior to the commencement of RISI was at (like all other statistics) a rather weak level. For Calabria, their RISI project was meant to be a joint effort of the region and the Technology Park to bring together the public and private sector to create a more

innovative environment in the region. Results thus far show that RISI did little to enable this.

This section has given us a statistical picture of the layout of the RISI regions. However, looking at statistics in isolation can only be of limited merit. In the next section I will carry out some simple statistical analysis of the above indicators. Statistics on the innovativeness of regions like RRSII, can tell us which region does better, but it says nothing about why it does better, and what was it that was most conducive to innovation in the RISI regions?

Figure 4.2 Revealed Regional Summary Innovation Index



Source: EIS, 2002

Statistical Inquiry

Correlation entails the provision of a yardstick whereby the intensity or strength of a relationship can be gauged. To provide such estimates, *correlation coefficients* are calculated. These provide succinct assessments of the closeness of a relationship among pairs of variables. In the analysis here I will use Pearson's Product Moment Correlation Coefficient, often referred to as Pearson's r, as the best measure when variables are interval/ratio.

Scatter diagrams are useful aids to the understanding of correlation. Pearson's r allows the strength and direction of linear relationships between variables to be gauged. Pearson's r varies only between -1 and +1. A relationship of -1 or +1 would indicate a perfect relationship, negative or positive respectively, between two variables. An example of a positive relationship between two variables would be between, say the percentage of the workforce of a particular region employed in agriculture and the agricultural output of that region. As the first variable increases then so does the second, Pearson's r would then be positive (between 0 and +1), the size of Pearson's r would depend on how much the first variable can influence the other. A perfect positive relationship of +1 would suggest a extremely productive workforce, whereby increasing it would lead to a direct increase in production (Bryman and Cramer, 2001)

It is also possible to provide an indication of the statistical significance of Pearson's r. The way in which this is calculated is strongly affected by the number of cases for which there are pairs of data. Here, we are dealing with about 24 cases, and that means that scores of 0.457 and 0.563 are needed to be significant at the 0.05 and 0.01 levels respectively. It is always good to know the statistical significance, however, it is more helpful when dealing with sample statistics of a greater population. In the case of looking at just the RISI regions, we have the statistics for the whole population.

The Wealth of Regions - GDP per capita in the RISI regions.

Here GDP is the dependent variable, and having a high GDP is dependent on many things, from an educated workforce, to a significant high tech industry presence, to low unemployment rates. In the list of correlation figures we begin to appreciate which variables have more of an influence on the dependent variable. Some have a greater impact than others but they can be usually divided into two groups; those with a positive impact on GDP and those with a negative one.

Pearson's r is equal to 0.324 and 0.365 for tertiary education and lifelong learning respectively. From this correlation we can say that lifelong learning has more of a positive impact on GDP than tertiary education for all RISI regions. However, more noteworthy is medium level education with a score of 0.685, it is statistically significant at 0.001 levels of confidence, and we can therefore say that it has greater likelihood of having a positive impact on a region's GDP than does tertiary education and lifelong learning.

NOTE: For the following scattergrams (Fig. 4.3 - 4.8) each of the 22 RISI regions are represented by a number from 1 to 22 as follows:

Liege = **1**; Brandenburg = **2**; Bremen = **3**; Schleswig-Holstien = **4**; Epirus = **5**;
Attiki = **6**; Extremadura = **7**; Murcia = **8**; Poitou-Charentes = **9**;
Midi-Pyrenees = **10**; Limousin = **11**; Midwest = **12**; Southwest = **13**;
Calabria = **14**; Steiermark = **15**; North Karelia = **16**; West Finland Alliance = **17**;
Blekinge = **18**; Vasterbotten = **19**; North East = **20**;
Yorkshire and the Humber = **21**; Wales = **22**

Figure 4.3: High educational attainment and GDP

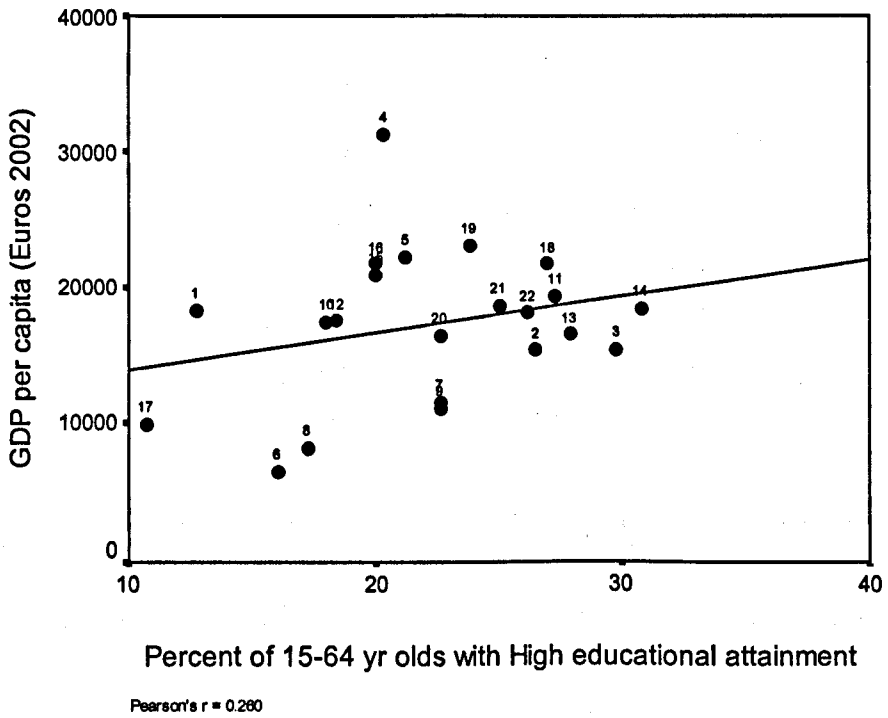
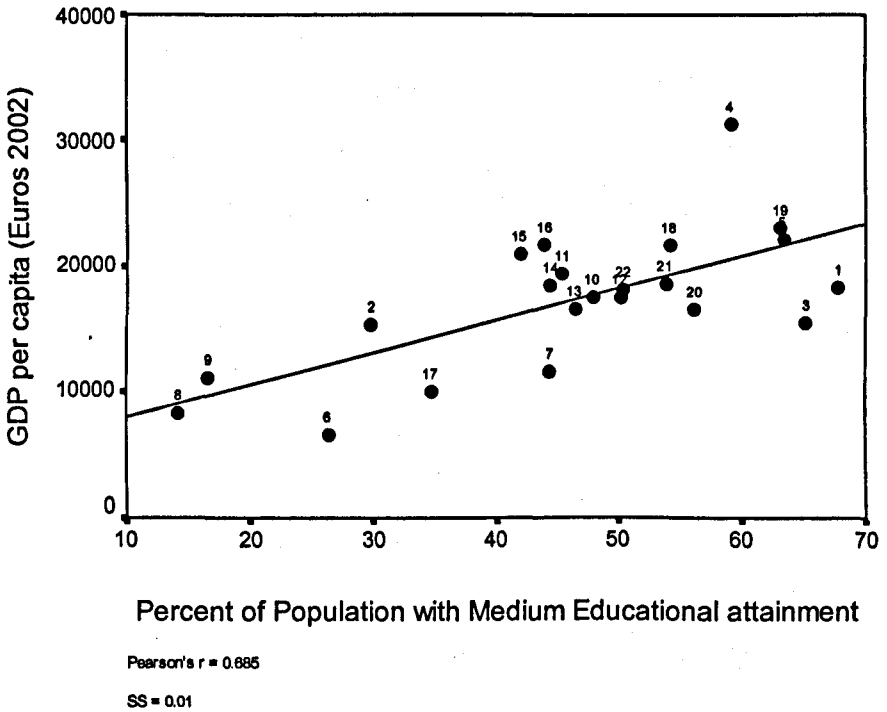
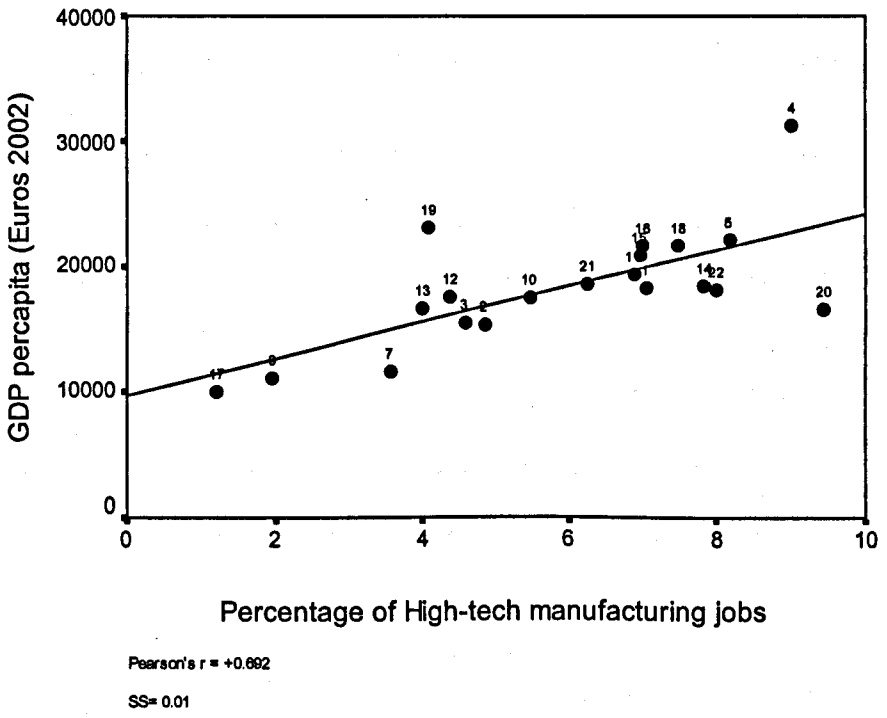


Figure 4.4: Medium Educational Attainment



Low educational attainment has a negative effect on GDP and in employment terms so too does a high percentage of workers in agriculture. For industry, there is a very weak positive relation of +0.076. However, for the indicator high-tech manufacturing, we see one of the strongest correlations of any variable we have used to measure RISI regions, in terms of their effect on GDP. With a Pearson's r of +0.692, high-tech manufacturing can be identified as one of the most important variables of a region's wealth. The correlation is less, but still significant for high-tech services which shows an interesting turnaround when we look at the higher-value-added ends of both these sectors.

Figure 4.5: High-Tech manufacturing and GDP



Two things worth noting in our analysis of GDP of RISI regions are R&D and patent activity. For R&D, what seems to be much more important for a region's wealth is the level of Business expenditure on R&D, which for the RISI regions ranks +0.557, while public expenditure R&D has much less of an impact at +0.343. For patents, the correlation is more strongly positive for regular patents than high tech patents and GDP.

One of the scores that seems to have had the least significant effect on GDP for RISI members is regional autonomy. This is an interesting point worthy of further investigation, since a considerable amount of regional theory calls for an increase of decision making at the regional level (Storper, 1997, Hudson, 1998 and Dunford, 1997). For the 22 regions of RISI, there seems to be little or no effect of regional administrative powers on that region's GDP.

What makes an innovative region?

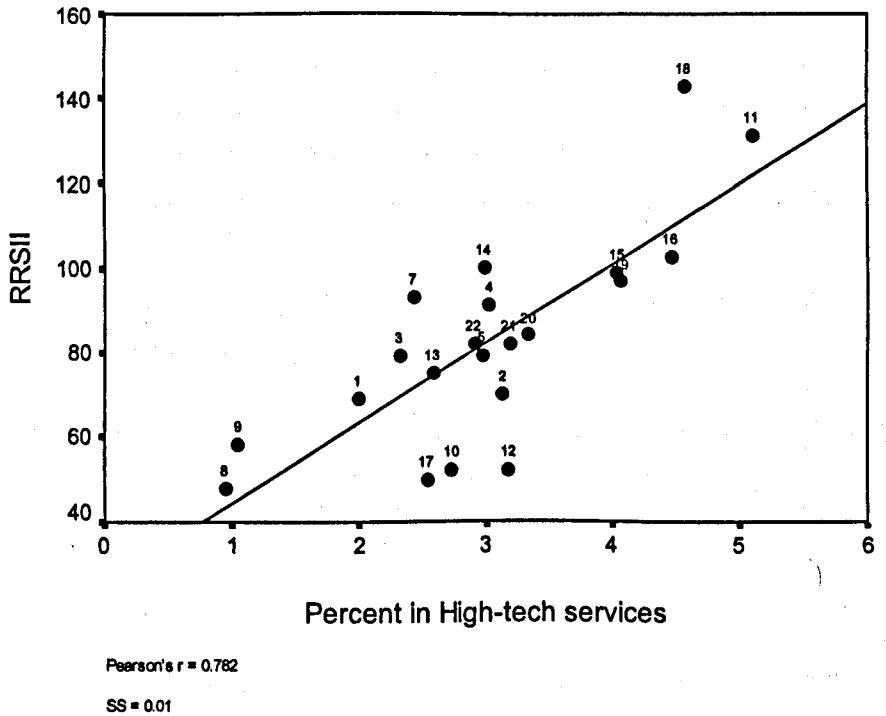
Looking at the revealed regional summary innovation index (RRSII) we can begin to interpret what is important in making a region innovative. Firstly, comparing it to GDP for RISI regions we see, rather interestingly, that the variance in either accounted for by the other is not overly significant. At +0.55 we can see that the correlation between GDP and RRSII is positive but not extremely strong. This is an interesting point that warrants further investigation later on. While RRSII is not the perfect measure of the innovativeness of a region, it is the best approximation available and perhaps the fact that it is made up rather of 'harder' economic indicators explains part of the reason why the correlation is not so high, because it is taking little account of the 'softer', more social aspects behind innovation.

Taking RRSII as the dependent variable we see a somewhat different trend in which variables have positive and negative impacts. Tertiary education and lifelong learning have a much greater impact on a regions' innovativeness than it does on its wealth with respective scores of 0.625 and 0.509, while Pearson's r for medium term education is a great deal less significant with a score of +0.374. The influence of education reverses with medium education having much less of an impact while tertiary education has a greater impact on innovation for RISI regions.

Sectoral employment in the RISI regions does not seem to make much of an impact on a regions' innovativeness. High-tech manufacturing has a correlation at +0.589, while that for high-tech services is +0.782, giving us one of the highest correlations. As we can see from figure 4.6 the relationship is linear and very positive and has regions like Blekinge and Midi-Pyrennes standing out in the top right hand corner of the graph, while the opposite end remains the domain of the southern RISI states. These figures give us a better understanding of the RISI regions at a particular point in time. However, at no stage should RISI be considered the dominant force of change in determining the level of

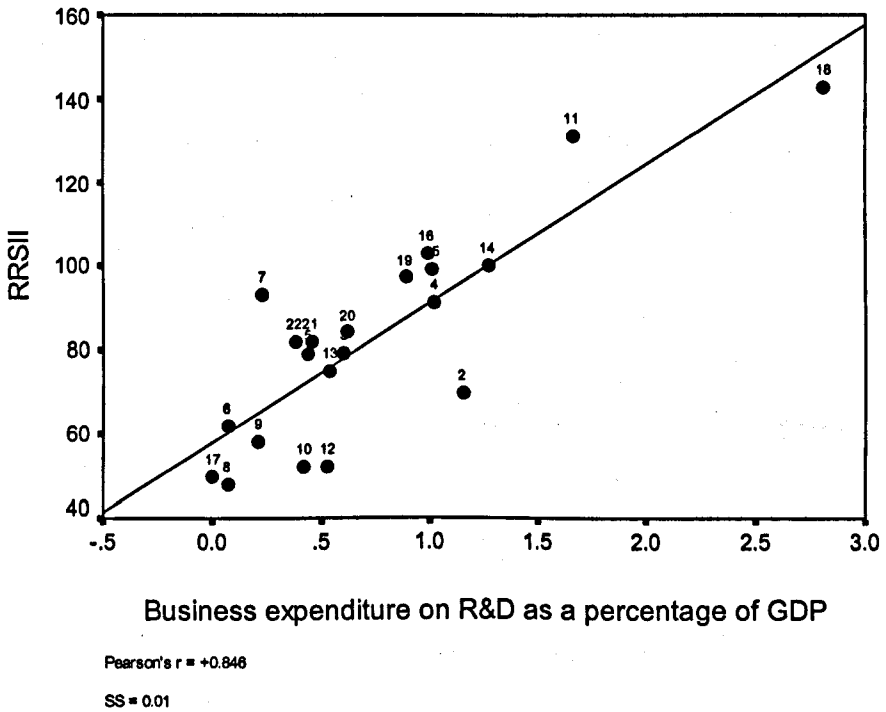
the statistics in the following figures (4.6 – 4.8) owing to the size and scale of the initiative. In this work I attempt to gain a better understanding of the impact of the theoretical change embodied in the bottom-up ethos of RISI.

Figure 4.6: RRSII and High tech services



The effects of R&D and patent activity on a region's innovativeness have been widely covered, for the RISI regions the causation is both ways and the correlations are positive and significant. General patenting gives a high Pearson's r of +0.691, while high tech patenting is even more significant at +0.712. However, the effects of R&D are even more noteworthy, with public R&D attaining a correlation of +0.676, while graph 4.7, is probably the most significant correlation at +0.846, demonstrating a near perfect correlation between business expenditure on R&D and a region's innovativeness in RISI regions.

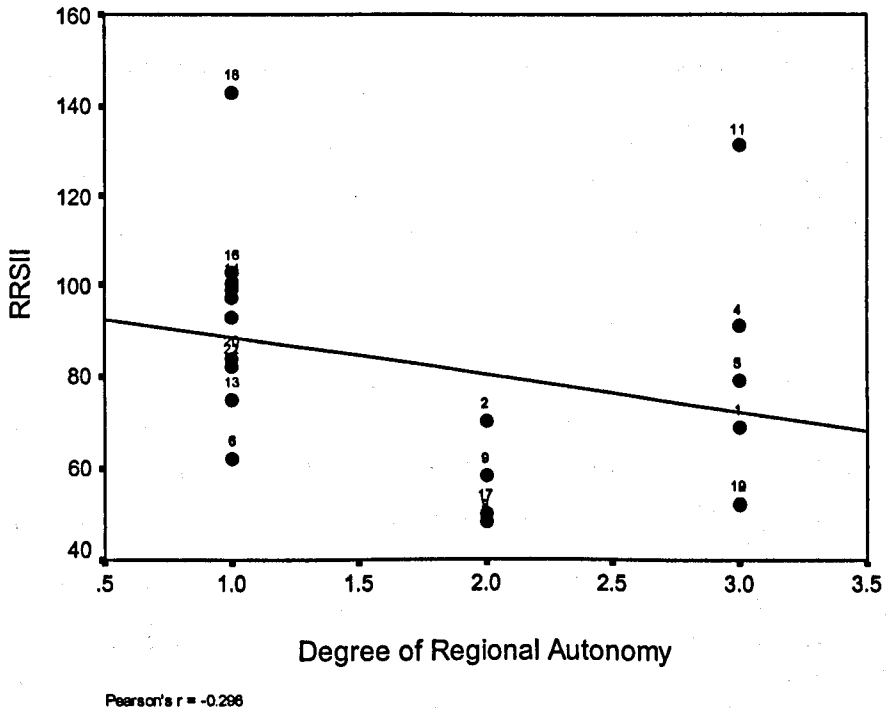
Figure 4.7 RRSII and BERD



The regions of Blekinge and Midi-Pyrennes again occupy the top right hand corner of the chart.

Finally, a negative relationship exists for the correlation between innovativeness and regional autonomy, as can be seen in figure 4.8. Here we see regions with low administrative powers among the lowest innovators. This, as with GDP does imply something unexpected about the effects of RISI region's self administration.

Figure 4.8 RRSII and regional autonomy



Statistical inquiry highlights some of the key determinants of regional wealth and innovativeness. While some results are quite predictable, others show what has only recently been realised in many policy making circles. The importance of medium education percentage regarding growth of GDP was first highlighted in the Commission's second report on cohesion (2001) and is duly noted in the context of the RISI regions. There are other facts that have come to prominence here, such as the relative lack of importance of regional autonomy. Before looking at my two case study RISI regions in greater detail, I first want to look at some of the survey results from the RISI regions. These qualitative methods in tandem with the statistics above will lend a better understanding of the impact of RISI on regions development in the information age. Here, like the statistical inquiry, it has become obvious that while some of the main foci of RISI are worthwhile, others have been over-looked or been of little consequence in the regions.

Survey results from the RISI regions.

In a survey sent out to all the RISI regions in the summer of 2002 I put questions to the RISI leaders on various aspects of the initiative (see appendix 1B). With nearly half the regions responding, this could be deemed a significant response level at 45%. By way of starting this section, it should be noted that responses to RISI by participants while on the whole were very positive did differ considerably between the regions. Where this difference is most marked I will make reference to it.

As a starting point, I asked the respondents to set out an overall idea of their impression of the initiative, they were asked to rank the initiative from one to five (one being the lowest and five the highest) in terms of objectives attained. Broadly speaking all the respondents were very positive, on average ranking it 3.9 out of five. From the very start national differences become clear, with Irish members, along with German, Spanish and Finnish, being the more complimentary. While the British and French were more critical. 16.6% of respondents believed that RISI only attained some of its goals while the remainder believed that the initiative achieved most of its goals. Reasons given by the more critical include:

> "Some of the actors we had on our project did not comply with the objectives" North East England
>
> "Some of the goals have been outdated or have partly been attained indirectly by activities or through 'framework activities' outside of RISI" Bremen, Germany

Respondents were asked to rate RISI in terms of the following statements:

A. Increasing inter-organisational networking
B. Increasing Job Creation
C. Increasing Information Sharing / Acquisition

D. Helping Regional Development

E. Helping to promote the Information Society

F. Creating stronger bonds between indigenous organisations

G. Creating stronger links between indigenous firms and foreign firms

H. Helping to promote the region nationally and internationally

I. The creation of a critical mass or cluster of innovative milieu

J. Increasing inward investment into the region

K. Generating greater trust between key actors

L. Creating a better understanding between the key institutions of the region

M. Advocating a 'bottom-up' approach to development

N. Creating a more inclusive Information Society

O. Increasing access to jobs for all members of Society

P. Minimising conflict between actors

Q. Bringing about cost effectiveness

Respondents were most enthusiastic about statements (N) creating a more inclusive information society, (E) promoting the information society and (A) increasing inter-organisational networking. When it came to more robust economic statements like increasing inward investment, creating more information society jobs, and creating stronger links between indigenous and multinational firms the respondents were much less enthusiastic, ranking all these towards the bottom of the list in terms of RISI contributing to them. An interesting contrast becomes evident across most respondents and that is the belief that while RISI was in all positive, it still had very little impact on real developmental issues facing each of the regions.

The survey went on to question whether or not, the RISI regions were involved in other initiatives, more specifically initiatives concerned with regional development in promoting the information society. In all, 70% of respondents had been involved in other regional/IS initiatives, which suggests that most of these regions were EU initiative aware. Initiatives varied from ASPECT, Tele-regions, New Knowledge Centre etc. all focusing on development in the information age. What is striking is the degrees of familiarity between regions, many of whom got acquainted through similar initiatives. It may be a step too far to interpret this as 'grab a grant' mentality amongst RISI regions, but it would be no underestimate to say that most of the regional actors are very familiar with EU IS and regional programmes. However, most regions who responded to the question of which initiatives they found better, highlighted RISI as the best. How much this answer is skewed by the fact that the survey was based on RISI or that the respondents had to get RISI money directly themselves is hard to know.

Interestingly, the Irish regions were amongst those most heavily involved in other European initiatives on Europe's information society. Second were the Spanish regions. It may be safe to say that the correlation between those regions who are involved in more initiatives and those regions which are more complimentary of EU initiatives are very high.

Awareness raising was seen as one of the key outcomes of RISI by all regions. Half the respondents believed that RISI raised awareness of the information society across their entire region, while the other half believed it covered most of their region. Positive quotes such as the following can be used to highlight success:

"Awareness was raised across all the region and every Sector" Liege

However, other follow-ups to the same question on awareness highlighted less successful undertones:

> "Many institutions are 'over-flooded' with information and have no capacity to co-operate or deepen their involvement. Private individuals are hard to reach with the initiative" Brandenburg region

With regards to tools used for increasing awareness, RISI regions tended to prefer using seminars and workshops over schools, universities and the media. Inclusivity has to be a factor worth thinking about when we consider this as a way of spreading the notion of the IS.

> "With the help of around 60 workshops key actors gathered in thematic groups. Schools were not the main focus, co-operation within schools was difficult, sometimes even refused" Bremen

> "Our Target was to concentrate on expert groups, not so much on the ordinary citizen" Murcia

Whether or not it is openly admitted by a region that it prefers to focus on one group over another, diffusion of the IS through workshops and seminars to a certain degree smacks of exclusivity.

Networking

As we have seen in the first section a very important part of RISI has been the creation of networking amongst actors. This has been both internal and external to the region with a well noted degree of networking between the member regions of the initiative. Firstly, questioning the types of network ties that are formed between the region, I asked the regions whether they would define the ties as either formal, informal, or a mixture of the two. Half the respondents defined the types of ties in RISI networking as informal, while 12% defined them as formal and the remainder as a mixture between the two. It seems as if a healthy mix between the two was preferred by the respondents:

"The ties were first formal, but became informal when we continued with the thematic workshop and seminars" Murcia

"A good mixture of both, you need to have a formal basis for collaboration to make the strategy and consensus building phase a success. It is hard to ensure a broad and serious commitment just on the basis of informal ties" Southwest Ireland

All respondents confirmed their networking with other RISI regions. Asked with whom they collaborated, there was on average a collaboration between the region and three other RISI regions. The collaboration continued outside RISI, it is hard to determine whether RISI was the start of these collaborations or just one in the line of many projects that regions decided to work on together. All answered 'yes' to having undertaken other initiatives with RISI regions, and looking at the start dates of other initiatives such as Leonardo, nearly two thirds of collaborations between RISI regions had been in place prior to RISI. Asked to list the reasons for successful or unsuccessful collaborations, most respondents answered that exchange of experience and gaining contacts were the best parts of collaborations, but one respondent also commented:

"Sometimes it was a success because some who played had already developed friendships and common purpose and were able to interpret the brief in a practical and productive way. BUT there are still some out and out 'researchers' who just want a funding stream" Vasterbotten

The geography of collaboration between member regions was not particularly distinct excluding that between regions of the same nation. Indeed, it seems to be only among the Scandinavian countries that we see any real proximity of regions networking with each other. The rest are notably diffuse with the exception of Southern EU RISI regions, where the geography behind the networking was obvious, but the amount of collaborations were few. Also of interest in the answers to the question of which RISI regions they

collaborated best with, it is interesting to note that two respondents listed regions that were never part of RISI (including the pilot IRIS and follow up eris@ projects).

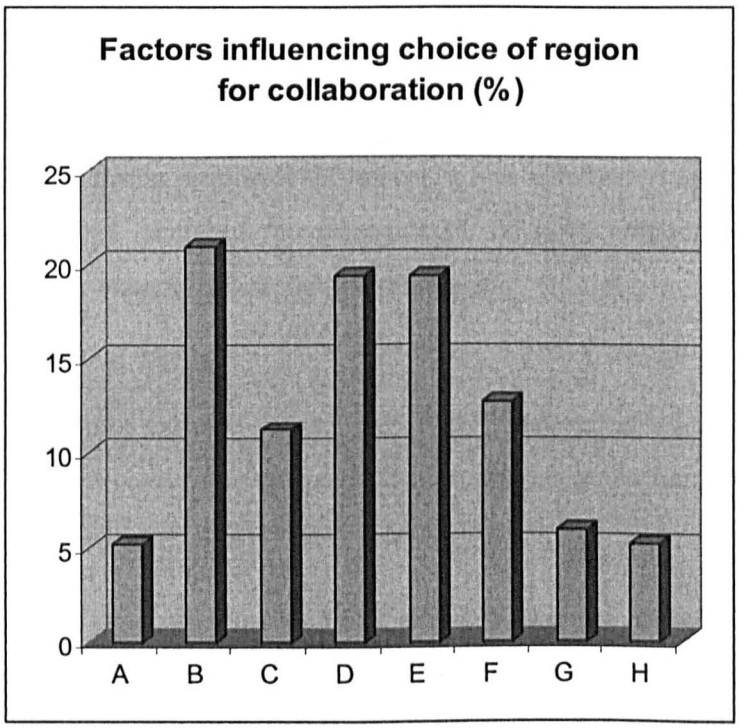
Looking at networking and collaboration internally in the regions, respondents pointed to universities as the most active networkers within the RISI regions. A pattern exists among regions with the less well off regions highlighting trade unions as most active as well as local councils, while the more well off regions looked towards universities and research institutions. Regional development agencies figured high in the forming of networks across all regions.

When asked why regions collaborated with some regions better than others they were given the following list of options:

A. Because the project dictated that you work in these regions
B. You chose the regions because of a very similar industrial and commercial mix
C. You and your partner region are of a similar size
D. You are both equally dependent on the same sector of the economy
E. Personal / social ties with members of other regions
F. You have collaborated with the respective region in the past
G. Pressure from the EU
H. Pressure from local industry

The responses are depicted in figure 4.9.

Figure 4.9 Inter-regional networking



As we can see, what drove RISI regions to collaborate with one another was significantly influenced by the kind of industrial mix they had in their respective economies. Personal ties also had a role to play, and to a lesser extent collaborations in the past and the respective scales of the regions. What seemed of little influence was external pressure, be it from the EU or local industry.

Participation in RISI

When asked why they thought their application to become part of RISI was successful, most regions were confident that they had good proposals that emphasised their abilities in networking and also their bottom-up approach to regional development in the IS. Some were more confident:

"We were already well established and the RISI proposal gave some support to our agenda – officially we did not qualify for support as we already were well down the line" Yorkshire and Humberside

It is obvious that regions had a very good idea of what the main aims of RISI were prior to submitting proposals. However, when asked why they failed to continue in the follow-up eris@ (three of the respondents did not), respondents were less willing to give a reason, except for one outspoken region:

"Grant regime – 'managing by silly targets' is too wasteful. We need to roll out what works not prolong the R&D pilot actions gravy train" Northeast region; UK

Given a list of statements and asked to agree or disagree, the respondents came up with some very positive insights into the initiative. On the whole they thought that the RISI was rewarding, significant to what they did, and its emphasis on the IS as opposed to the information economy was right. They did not think it was too politically motivated, they thought it promoted the economic development of the region, promoted learning and knowledge diffusion, and especially bought together many different sections of society together in the IS.

They placed increased networking and increased awareness of the IS as the main benefits of RISI, along with increased inclusion, while also admitting that RISI did not bring investment into the region nor did it have much impact on job growth. Some respondents noted that the latter were not short term and it would be necessary to wait to see if it happens. However, the contradiction is noteworthy; regional economic development is long term also, yet if respondents believe that RISI has brought that about then why or how did it not bring a greater number of jobs about as well?

What has become obvious from the above analysis is that different regions have created different projects which have and have not attained their goals. Some RISI regions have set about ambitious goals because they can afford too; such regions can look at RISI as a tool to enable the social and cultural development of the region. For other regions these types of goals lack the priority of increased employment and wealth. The RISI regions are heterogeneous as are their goals and their perceived benefits, but the ethos behind the initiative is shared by all 22 regions. For a more in depth look at regions and their projects the next section is dedicated to my two case study regions, the Midwest and Southwest of Ireland and their respective RISI projects, ShiPP and STAND.

Case Study regions: Midwest (Shannon) and Southwest of Ireland

Choosing both these regions as case study regions in the context of RISI was straightforward. This work focuses on the developmental effect of the Information Society on Ireland, taking RISI as an example of a new approach in pursuing the IS in the EU. It was therefore decided that my case study regions should be both Irish RISI members. As already seen, both regions do stand out from the remaining 20 regions in many aspects, not least the fact that both saw a massive increase in economic development over the coinciding time period of RISI. Figure 4.1 showed GDP growth figures over the five year period up to 2000, and we saw how the two case study regions outpaced their RISI counterparts in this important measure. At the same time, the Irish regions are notably enthusiastic about their RISI experience with both regions continuing their involvement in eris@ and unabashed about the success of their projects as the following quotes from the project directors infer:

> "TITAN, ASPECT, TIME, DATE are all very successful EU projects that we have been involved in over the past couple of years, but RISI, RISI was the mothership and without it none of the rest would have happened, we were fortunate to get in early with RISI"
>
> STAND Project Director, Interview, August, 2002

> "We got in with ENCATA, a project that focused on ICTs in rural regions, then RISI was just abeggin'. It got all the major actors together in the region for the first time, and looking at it six years later, it has been a huge success"
>
> ShiPP Project Director, Interview, July, 2002

However, while both regions have praised the initiative, the admiration is not one-way. In an evaluation of the initiative, both regions were hailed as one of the success stories of RISI, as the following quote from the RISI Director makes clear:

> "Yes, both the Irish regions really got behind the initiative, their steering committees were dynamic and involved, their projects were ambitious, but attainable. They had a lot of determination and go"
>
> RISI Co-ordinator, ASPECT Conference, Lille, October, 2001

At the same conference, there were many other admirers of both regions' performances over the late 1990s. Some of it was a blind acceptance that it was simply down to RISI and similar EU IS initiatives. The fact of course remains that the economic transformation that both regions underwent along with the rest of Ireland has had the biggest impact. A more realist opinion was later offered by co-ordinator of RISI:

> "Well you see, they had the advantage also of being the perfect types of region to make this kind of thing work, other regions were nearly five times the size of these guys with the same population, for them it was much harder"

The issue of scale referred to above has proved crucial for both regions. In an Irish context both regions were chosen as case study regions, understandably because of their involvement in RISI. That aside, both regions are also unique in an Irish context. Both are NUTS3 regions made up of either 2 or 3 counties. Unlike the remaining Irish regions (excluding Dublin) both regions are well served by conurbations of critical mass. For the Southwest region, this is Cork city, Ireland's second largest, and for the Midwest region,

it is the Limerick-Shannon conurbation (effectively accounting for Ireland's third largest city). Outside of these are significant towns, such as Mallow and Fermoy in the Southwest and Ennis and Nenagh in the Shannon region (see Map 4.2). With such a network of significant nodes, both regions are unique in an Irish and RISI context, and also in a position to take advantage of the IS in terms of awareness raising and infrastructure provision. To look at regional development in the IS, I have chosen Ireland as testbed for gauging the impact of submersion in ICTs, and RISI as a way of bringing about the IS; my case study regions serve to bring the two together.

Midwest/Shannon[5] **ShiPP**

Shannon is a relatively diverse region, encompassing areas of strong urban growth particularly the Limerick/Ennis/Shannon triangle, including the regional capital of Limerick City, Shannon Airport, Ennis Information Age Town and third-level education institutions in Limerick and Thurles. The region also contains a number of rural areas with significant population loss and decline, such as the West Clare seaboard and parts of West Limerick. This internal diversity militates against a strong sense of regional consciousness. In addition, several parts of the region display a significant orientation outside the area, and often look to other centres elsewhere. For example, South Offaly is very much part of the Midlands Region and parts of North Tipperary would tend to look eastwards rather than towards the hub of the Shannon Region. Though the region is mainly rural, in recent years it has had a continued decline in agricultural employment. Industry has shown considerable growth, with an equivalent increase in services employment, which is set to grow by 15% from 2000 to 2006, representing the strongest performer in job creation (Shannon Development, 2000). Unemployment fell to 4% in 2000. However the growth in employment in the region was 4% below the Irish National average over the period 1993-1997 due to structural weaknesses in the economy arising from the high profile of agriculture. Deprivation, both urban and rural, is an issue of concern in the region. The key indicator is long-term unemployment, which continues to be too high at about half of the total unemployment rate (CSO, 2000).

[5] Data referring to the Midwest and the Southwest region in the following two sections has been retrieved from the Central Statistics Office publications and the website; www.cso.ie

Map 4.2 Irish Regions and main urban areas

Source: Adapted from infrastructure.ie

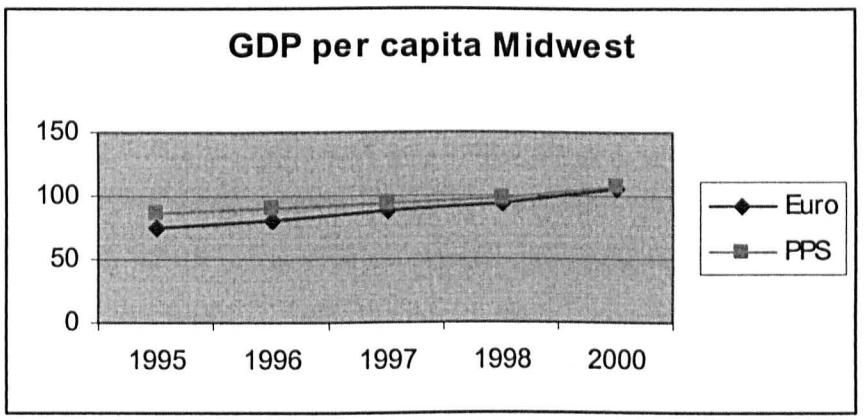
The Greater Limerick/Shannon Area has become one of the major economic achievers in Ireland over the last number of years. Revitalised by new industries and laudable restoration projects, Limerick the regional capital still stands as the Republic's third city. The City is a business and commercial centre within easy reach of Shannon Airport. Infrastructural investment in the city has soared and all business sectors have experienced growth, in particular, the services, technology and educational sectors. (Limerick Chamber of Commerce, 1998).

The Shannon region is one of the smallest of the RISI regions. It lies at NUTS level 3 which makes information on the region somewhat harder to come by. However, the region itself consists wholly of the counties of Limerick, Clare and partly of Offaly, Kerry and Tipperary. With a land area of 7,870 km square and a population of 317,000, the region is left with a population density of 38 persons per km sq. While it is the fourth smallest region in RISI, it has the second lowest population. Facts of demographics and land area, are not solely for background purposes, but can indeed prove vital to regional governance and especially the implementation of the Information Society. The population here is also a relatively youthful one: this too is not just a trivial fact but can be a major determinant of a region's openness to learning in the knowledge economy. Population here is also on the increase, at a rate of 3% over the last 10 years (CSO, 2001).

Figure 4.10 depicts the regional success story that is the Midwest region of Ireland. I say regional because, the mistake is often made that the economic benefits of Ireland's new-found competitiveness from the 'Celtic Tiger' is proving to be a regional phenomenon. While it is hard to argue against the fact that the people of Ireland are better off after a decade of prosperity, it is quite easy to argue that the reaping of the rewards was very much a regional based occurrence. The Midwest region, was one of the regions that did benefit. Much of the reason why it did was due to the presence of Limerick city and the

ever growing Shannon town. Over the period depicted in the graph, we have not seen any other region achieve such a boost in their GDP per capita. Regardless of the measure looked at, the trend is an increase. What is also worth noting is the strength of PPS over the Euro. There are many reasons for this rather novel trend in Ireland, not least is the monetary policy of currency devaluation pursued by the government. This policy was pursued to curb inflation, and from the graph it is evident that it was successful.

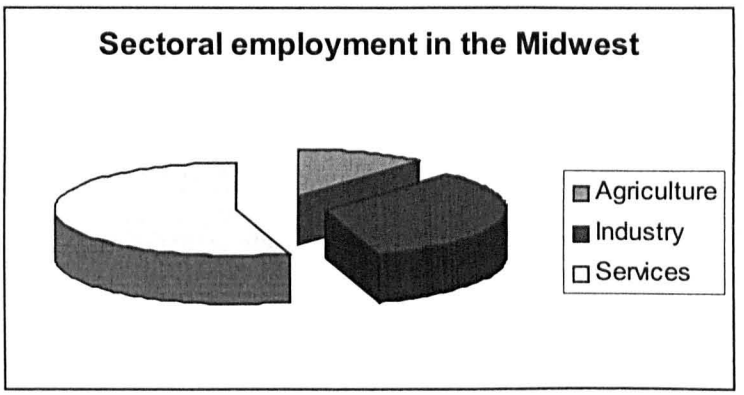
Figure 4.10 GDP per capita in Euro's and Purchasing Power Standard (PPS)



Source: Adopted from CSO, 2001

Looking at the significance of agriculture in the Midwestern economy in figure 4.11 we see that 11.7% of the persons employed in the region are in this sector. Comparing this figure to the rest of the RISI regions we see that it is somewhat above average; however, taking into account the history of the region one would expect this figure to be somewhat higher. Ireland as a whole has been an agricultural economy for the greater part of the last century, and the Midwest region was the most productive region in the western seaboard. Also worth noting is the relative size of the manufacturing sector, again, there are historical factors at play here. Not least of these is the importance of Limerick as a textile city in Ireland. A total of 54% of the active labour force was employed in the services sector, acting as another defining fact of the region.

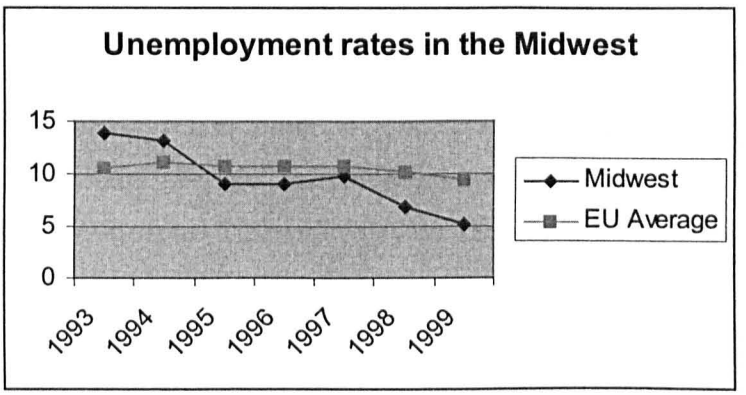
Figure 4.11 Sectoral Employment in the Midwest (1999)



Source: Adopted from CSO, 2001

Declining unemployment rates are another success story for the Midwest region. Again in figure 4.12we see the region 'breaking the mould' of the RISI regions, with regards GDP per capita, where it has seen substantial increases, while with respect to unemployment rates it is the opposite. Over the seven years we see a relatively uninterrupted decline in the number of persons unemployed from 13.8% in 1993 to a low of 4% in 1999. This again coincides with the new found prosperity of the region and the country's realisation of its productive potential. As we shall see in the following two chapters, macroeconomic policies play a significant role, as do the information society policies promoted in the region. Another significant rate is that of young people unemployed, the region has the second lowest rate amongst RISI regions, where it lies at 7.6%.

Figure 4.12 Unemployment Rates



Source: Adopted from CSO, 2001

In 1999, the region invested 1.5% of its GDP in research and development, a low figure in European terms but average in National terms (see Chapter 6 for a detailed analysis). The educational attainment of the region could prove to be the point where it might let itself down. The figure for the region is very similar to that for Ireland as a whole, showing a rather large proportion (48%) of the population having only attained low level education. More positively, 23% of the population have graduated at a tertiary level.

The Shannon region has an interesting mix in terms of foreign and indigenous owned industry, employment figures for these show the uniqueness of the region in national terms. Here, twice as many people were employed in foreign owned industry than in indigenous industry in 1997, a ratio unmatched by most EU regions, while for the rest of the Irish regions the figures are usually equal. This is also reflected in R&D figures for industry. Foreign-owned industry spent €60million on R&D in the same year, which represents nearly 18% of the national expenditure, a disproportionately high figure for the region (IDA, 2001). These latter figures are indicative of the openness of the Shannon region, a premeditated goal of its own development agency, Shannon Development which will be dealt with in detail below.

SOUTHWEST STAND RISI

The Southwest region of Ireland, on the other hand, is more of a microcosm of the nation in many ways. It is dominated by Cork city, much as the nation is by Dublin, it has proportional representations of sectors of employment, and while GDP growth is above the national average, population growth matches it. In 2000 the total population was 558,600 people. This is 15.1% of the population of the State, which was unchanged compared to 1991. The urban population accounted for 53.7% of the total population (national average58.1%). It is the only region, other than Dublin, with urbanisation rates greater than 50%. This is due to the Greater Cork Area (LUTS Area) with a population approaching 240,000 inhabitants, which is the second-largest conurbation in the country. Kerry has two substantial urban areas in Tralee and Kilarney.

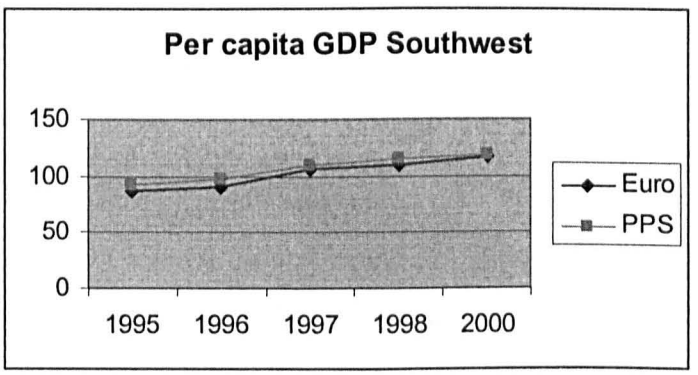
The Southwest contains a representative blend of large and small urban centres and rural population while also possessing a mix of foreign-owned and indigenous industries. Some relatively unique features are the traditional dominance of agriculturally-based industry and clusters of electronics and chemical firms. The region also has a large tourism sector. The South West Regional Strategic Plan 1996-2001 identifies four recognisable sub-regions within the overall South West. These sub regions are:

- North Kerry
- North Cork
- South Kerry and west Cork
- South Cork

This Objective 1 in transition region covers 12,161 km square leaving it with a population density of 44 person per square km, however, as is the case with most regions, the figure is skewed by a major urban area, in this case Cork city. The population of the region is on the increase, recording a growth of 0.5% over the last 10 years. As with the Midwest region, the demography of the region is predominantly youthful, with nearly one-third of the population under 25.

The region has many features in common with the aforementioned Midwest. Not least of these is the expediential increase in wealth as measured here in terms of GDP per capita. As the graph below demonstrates, the region has experienced a rise in both measures of GDP of between 15 and 20 percentage points. Over the short time period shown this increase is quite a phenomenon.

Figure 4.13 GDP per capita in Euro's and Purchasing Power Standard



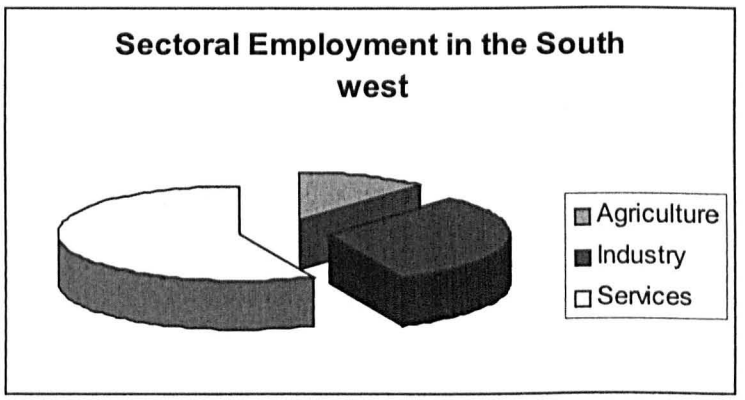
Source: Adopted from CSO, 2001

A point of interest here is noting the common trend amongst some regions where GDP measured in PPS is higher than that measured in Euros. Indeed, this is the case for nine of the 22 RISI regions. This pattern occurs predominantly in regions from the Cohesion countries, Ireland, Spain and Greece. One explanation is the rate of exchange of national currencies, for the cohesion countries; there currencies were usually less stable and therefore weaker on the market. So when currencies are pegged against the Euro, the natural tendency would be for them to somewhat undervalued. PPS measuring the worth of the currency in exchange in the national economy could then be stronger because of the undervaluation of those currencies in the European/World currency markets.

The Southwest region shares the same proportion of the workforce involved in agriculture with the Midwest. Standing at 11.7%, this is a figure in decline. Historically,

this region was also very much agriculture orientated, in the last 40 years the dominance of this sector has started to decline. In the Southwest, where agriculture lost its share of employees, the service sector gained, figure 4.14 shows this to be 56.5% of the workforce, a figure that is very much on the increase here. Manufacturing/Industry accounts for nearly one-third of the workforce, a significant proportion, one which is mostly accounted for by Cork city and its environs. Cork, having a deep harbour makes the setting up of heavy industry there more feasible; industries such as Irish Steel are attracted to the city for that reason.

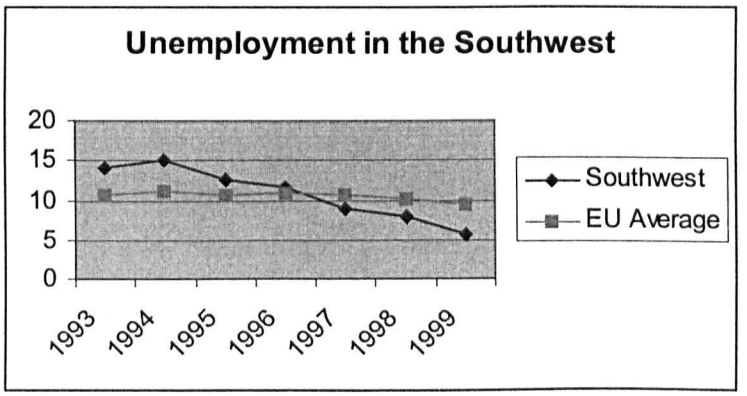
Figure 4.14 Sectoral Employment in the Southwest (1999)



Source: Adopted from CSO, 2001

The trend for unemployment also follows quite a similar path to that of the Midwest. As we can see below, the region started off the decade with a high unemployment rate of 14%, well above the EU average. While this rose for 1995 to 15%, after that year it started its uninterrupted decline. This continued at a rather steady pace to 5.8% for 1999, near enough to full-employment for the region. Over the time period, we have seen the rate dip well below the EU average, the rate as it was in 1998 was the same as the national average. It is over the same timescale as shown in the graph that unemployment shifted from public enemy number one on the policy agenda to a problem that appeared solved by the turn of the century.

Figure 4.15 Percentage Unemployed



In terms of educational attainment, the region has some 45% of its adult population with low educational attainment, again a figure that could be considered too large. One-quarter of the population have tertiary level educational attainment.

Employment in foreign and indigenous industry in the region is, much like that of the nation, split near 50/50. In 2000, 22,813 were employed in indigenous industry and 23,342 were employed in foreign-owned industry. Comparing these to the 1995 figures we see evidence of the Southwest region 'opening-up' as employment in foreign-owned industry grew by 47.4% over the time period, the corresponding figure for indigenous industry was 25.2%. All in all research and development accounts 1.1% of GDP in the region, but the difference between this and the Midwest region is marked in how that expenditure on R&D is accounted for by indigenous and foreign industries. Indigenous industries in the Southwest spend nearly three times as much on R&D on the whole than their Midwest neighbours, but R&D spent by foreign regions is nearly €20million less in the Southwest (CSPinfo, 2001). This points to the difference in terms of ownership of industry in both regions with the Midwest being considerably more dependent on foreign investors.

Project Directors and major actors in the regions.

Every RISI member has a project director to head the region's initiative, for the majority of regions the director usually hails from the region's development agency/authority; both Irish regions are no exceptions. ShiPP, was headed up by Shannon Development, the region's own development company, while in the Southwest, STAND was led by the regional authority there, the SWRA. This section will take a brief look at both these actors and their influence across the region as a whole.

The Shannon region is truly distinct from all other Irish regions in that it has its own regional development company, Shannon Development. It has been provided with a broad remit 'to initiate participation in and support integrated development that will achieve sustained economic growth in and throughout the Shannon Region' (Regional Report, 1999: 1). Shannon Development has been one of the main drivers of development in the Shannon region since its foundation as Shannon Free Area Development Company in 1959 to promote Shannon International Airport in the post-jet era. The late 1950s brought with it an unwelcome leap in aviation technology for the region which would see planes fly further without the need for a stop-over in Shannon Airport. The new, long range jets had no need of Shannon as a service station, but there were those who were not convinced the airport was finished. Brendan O'Regan was one of them - he made his name by developing Shannon as the world's first duty-free airport shopping centre. In an interview with the Irish Times (May 15th 1958) he insisted:

"We must reach up into the sky and pull the business down"

The brief given to the company in 1959 was wide:

- to maintain and increase passenger and freight traffic
- to create additional employment through the establishment of industrial enterprises
- to enhance tourism potential through the creation of new tourist attractions

The impact of the newly formed development agency was quickly seen in the Shannon region. Although an agency of the State, it was set up as a limited liability company with considerable freedom of action. Its very specific regional focus and flexible approach allowed it to take speedy advantage of the resources at its disposal. In particular, Shannon Development participated in the successful Midwest initiative to establish a regional university with a technological bias in Limerick (Nathaniel Lichfield, 1969:1), opened to students as the National Institute of Higher Education (NIHE) in Limerick in 1972 and receiving University status in 1989 (now known as the University of Limerick). Significantly, both UL and Shannon Development stress the importance of fostering partnerships, linkages and networks with actors across the region in their institutional ethos and everyday practices. Thus, UL and Shannon Development have over time created inter-institutional linkages and an actor network, whose institutional expression is perhaps best exemplified in the National Technology Park (NTP) for science and technology companies on UL's campus (Andréosso-O'Callaghan, 2000).

The NTP has become home to a growing and influential nucleus of high-technology and knowledge-based companies. With over 80 organisations employing over 3,000 skilled people, the Park has a balanced mix of multinational subsidiaries, Irish technology companies, R&D entities and support services, which occupy more than 30 buildings with a total floor area of circa 1.5 million sq.ft. I.C.T., materials and e-business are the dominant sectors at the National Technology Park. Overseas firms including Cook Ireland, Cognizant Technologies, O2, Modus Media, Orygen, enjoy the benefits of being located at the Park and are successfully doing business alongside a strong cluster of Irish-owned, technology companies such as Ashling Microsystems, Piercom, and PrimeLearning.com. As chapter six will make clear, the NTP has become a significant cluster of activity in the Irish software market (NTP.ie, 2003).

The common institutional emphasis of the regional actors on creating regional partnerships, linkages and networks appears to be an integral component of the regional

development strategy for the Shannon region, devised in part to overcome 'market failure' and other disadvantages of peripherality within Ireland and the EU (Shannon Development, 1996). As a result, the Shannon region may be characterised as an emerging 'learning region' in which innovations are nurtured (for example, in knowledge based companies at the NTP) and then spread throughout the region via the regional institutional linkages and actor networks. In this way, the University of Limerick and Shannon Development are the two important institutional actors in the region's development strategy:

> "Our focus is on Information transfer - that is what we are here for really. We have the co-op programme that sends our students out to work for a year, we have the business technology information service and we also have the NTP, we appreciate our contact with the local business world as they do us"

(Interview with the Industrial Liaison Officer, University of Limerick, August 2002)

> "We redefined our mission statement recently as 'regional development in the knowledge age', for us to be success with this in the region we have to go forward, as we have done, with the University of Limerick"

(Representative of Shannon Development, Interview, August, 2002)

The apparent success of UL as an educational driver in Limerick has inspired Shannon Development to export this model to other sub-regional areas, specifically to the Institute of Technology Tralee (ITT), and the Kerry Technology Park:

> "ITT acquired a 60 acre site about a mile up the road from here and Shannon Development acquired land adjacent to it and together they came up with the concept of creating Kerry Technology Park, which is on a much larger and more ambitious scale than the Kerry Innovation Centre here. The focus is on IT and HPSUs it is run by Shannon Development, but the intention is that we create some spin-out companies from the college and have a large degree of collaboration."

(Liaison Officer, Institute of Technology Tralee, Interview on location, August, 2002)

What becomes obvious when you look at the Shannon region is the wealth of networking and collaboration ongoing across different sectors and space. The types of networking prevalent here encompasses the full spectrum from formal collaborations, such as that between ITT and Shannon Development, to informal connections through friendships between actors built in a relatively small region with a high degree of interaction. What is also of note, is the high degree of compatibility in language used by the various actors in the region, making use of similar terms such as 'interactive networking' and 'collaboration'. More noteworthy still is the degree of similarity between these popular terms and those used in the RISI outline. The kind of focus of the main regional actors of the Midwest region, not least Shannon Development, complements that of the regional information society initiative. For this reason alone it was obvious that the Shannon region would easily fit with the RISI project outline and thrive as part of it.

The Southwest region is somewhat more conventional in Irish terms regarding its RISI project leader. STAND has been carried out under the auspices of the Southwest Regional Authority (SWRA). Established along with the other seven regional authorities under the Local Government Act of 1991 the SWRA has a general competence and wide remit to do all things necessary and expedient for the effective performance of its functions. These include:

- The promotion of co-ordination in the provision of public services in the region;
- Promotion of co-operation, joint action between local authorities, public authorities and agencies;
- Review of overall development needs and public services in the region;
- Review and monitor implementation of measures for which EU assistance is made available.

According to its mission statement the SWRA has "adopted a proactive, partnership based, representative approach, engaging in a number of EU and nationally funded initiatives, with the over arching aim of improving the sustainability - economic and social - of the region as a whole, in a spatially balanced and inclusive manner" (SWRA, 2000: 3). Since the mid-1990s the Authority has developed an expertise in IS based projects, with a particular emphasis on ICTs as tools for regional development:

"The approach that we are going for now is the knowledge-based industry one - clean, indigenous, high start-up, high growth Irish owned companies"

(Director of the SWRA, Interview, July, 2002)

The SWRA has partners in various activities, from the Regional Operational Committee to pan-European programmes, including local authorities, public and state sector, third level institutes, vocational education committees, community and voluntary representatives, development agencies, LEADER and ADM groups, national training agencies, enterprise boards, Business Innovation Centres, disability groups and government bodies to name but a few. The SWRA also works in close co-operation with the other seven Irish regional Authorities, both on a unilateral basis but also through the aegis of the Irish Association of Regional Authorities. These networks facilitate the greater awareness of the project activities and outcomes, and provide ready opportunities for the regions to participate with one another on a national basis.

The SWRA has been heavily involved with other main actors within the region, such as University College, Cork, Cork Institute of Technology, the Southern Health Board and the IDA, many of these collaborations are the result of their participation in RISI.

> "I'd say that maybe we had met some of the guys before RISI, but we definitely gained more contact and contracts as a result of it. It was unique in its regional focus which has helped us tailor what we do to the needs of the region, something we might not have been aware of before"

(Liaison Officer, DEIS, Cork Institute of Technology, Interview, September, 2002)

A similar view is held by many of the interviewees, which place the value of local knowledge and RISI's way of exploiting it at the top of the list of reasons for RISI's success. According to most of the region's main actors, the SWRA was instrumental in bringing them together, for the better of the region, nowhere more so than in Cork city itself. The RA's focus on software companies and ICT has coincided with the emergence of a significant hub of activity there (see Chapter 6 and Grimes and Collins, 2002). In 2002, after a series of meetings between the public representatives of the city of Cork, the corporation and SWRA, with the IT industry there, the National Software Campus on the outskirts of the city was opened. The National Software Centre was a direct reply to one of the main issues raised at these meetings: the need for a physical building that would go towards making Cork a centre of IT excellence.

The purpose of the National Software Centre was to establish Cork City as the most preferred regional location outside of Dublin for IT inward investment and a leading centre in Europe for niche software development in collaborative teams and joint ventures. Again the emphasis here was on networking and collaboration, and according to one company located there the reasons for this were obvious:

> "Well we came here in April – we are a shareholder in the building. Also another thing that is very important is rubbing shoulders with your peers to learn from each other and work together a lot better than we are. I think there are great opportunities out there – when you think of it there is a huge sales force out there selling solutions – if we knew about each other and were not competing with each other we would be able to help each other. It's the whole thing about letting everybody know what everybody else does. Working in the same building and the same campus is part of that."

(MD of Vistech Ltd. Interview, August, 2002)

The NSC can be seen as a direct response to the National Technology Park in Limerick, its ethos is the same in that it promotes networking and collaboration, probably more so because of the fact that all businesses are located under one roof with a shared communal area. However, the NTP has the lead in terms of bigger names, bigger business and a much more robust link with the nearby University.

The SWRA shares many traits with Shannon Development in their respective views of how a region should develop in the information age. Both place knowledge intensive industries high on the agenda and both also place a great deal of emphasis on networking and collaboration. However, subtle differences do exist, and many of these differences can be traced back to the different types of agencies that both organisations are: Shannon Development is a limited company and therefore does not always have to answer or follow a path set out by central government, while the SWRA is a public government organisation. Therefore, in the Southwest, while the emphasis is on knowledge intensive industry there is a marked emphasis on the development of indigenous knowledge intensive industry. The same is not necessarily true for the Midwest; in very few places does it put any bias towards homegrown industry. Likewise, in terms of networking, SWRA calls for a much wider scope of organisations in any network, usually with a significant presence of public sector and indeed more socially-minded organisations, while the scope in the Midwest seems much more narrow and focused on private industry. These differences become more pronounced when we take a closer look at each region's RISI project.

ShiPP and STAND: The Irish RISI projects.

This section will look at the two projects in the RISI regions and compare Steering Committees, Strategy and Action Plans and progress. It will highlight the fact that while these regions have much in common their differences also make for different priorities in terms of the type of IS project they put in place. Judging the pure impact of this initiative is a near impossible task considering the external changes that the regions have undergone over the same period of time. However, what can be taken from this type of evaluation is whether or not this 'type' of approach is appropriate and whether or not it can stem the increasing regional divergence in the information age.

The Steering Committees of both regions are depicted in the table below:

Table 4.6 The Steering Committees

ShiPP Midwest Region		**STAND Southwest Region**	
SC Member	Type of organisation	SC Member	Type of Organisation
Shannon Development (Director)		Southwest Regional Authority (Director)	
East Clare Telecottage	*Private Company and Service Provider*	Cork Institute of Technology	*Higher Education Institute*
Ennis Information Age Town	*Public initiative turned private*	University College Cork	*Higher Education Institute*
Enterprise Ireland	*State body*	Enterprise Ireland	*State body*
IBEC	*State body*	Cork Corporation	*State body*
Innovation Centre	*Private company with State funding*	FAS	*State training body*
University of Limerick	*Higher Education Institute*	Vistech Ltd	*Private Company*
IT Tralee	*Higher Education Institute*	Southern Healthboard	*State Body*
Tellabs Ltd	*Multinational Company*	Telecom Eireann	*State Body turned Private after liberalisation*

What we see in the make-up of the respective Steering Committees is a slight difference which would not imply a difference in the goals of the respective projects, rather a difference in the approaches to these goals. Higher level educational institutes are well represented in both, with Universities and Institutes of Technology appearing on both committees, from this we see an obvious acceptance of the importance of the role of education in both regions for pursuit of the IS. Other committee members shared include Enterprise Ireland, one that plays a much smaller role in the Midwest owing to the presence and similar work of Shannon Development. After accounting for these members we begin to see a difference in the remainder. For the Midwest we see two indigenous companies and one Multinational in the form of Tellabs. In the Southwest the remainder of members are mostly public service agencies such as the Health Board and the Employee training agency, FAS. Along with Cork Corporation we can see that the focus in the Southwest is much more oriented towards people, while with private business and employers groups sitting on the Midwest committee, we see a shift of emphasis to the business sector.

Looking at the Strategy and Action Plans of both regions we see a similar trend emerge. The ShiPP project aimed to build a regional Information Society based on a vision that stressed the expected benefits for all citizens. It was that of "a proactive approach to generate new employment activities, to improve the competitiveness of enterprises, while addressing the challenges of structural adjustment" (Shannon Development, 1998:1). To that end, six key areas were identified and working groups set up in order to monitor the corresponding projects defined by the ShiPP action plan. These areas were infrastructure, learning, awareness, community, enterprise and public services.

Infrastructure Objectives aimed "to minimise the impact of peripherality by proactive public policy and actions in favour of rural areas to match the market driven IS infrastructure of urban ones" (ibid, 35). These goals were also concerned with the creation of a mutually supportive regional Information Society innovation system, based

on the creation of 'innovation nodes' linked to the National Technological Park in Limerick and co-ordinated with higher level educational institutions.

Learning was an important priority, it aimed to deliver different levels of ICT education and training and business courses in the entire region by an approach that combined decentralised centres of education and video conferencing. The corresponding model was the Tipperary Rural and Business Development Institute, a third level educational facility designed as a distance learning campus with outreach presence across the region. It also supported local primary and secondary schools in their actions concerning the implementation of the national IT 2000 initiative in basic ICT training, as well as Community Access Centres and adult education institutes.

Community actions were concerned with both urban and rural areas but an emphasis was put on small towns and villages. Identification of needs was a starting point for specific actions capitalising on existing local initiatives or projects. This was to be carried out through rural audits which covered telecom infrastructure and access as well as economic activity, resources and potential. It was hoped to identify one village and equip it with state of the art telecoms infrastructure, similar to investment at Ennis.

Awareness was major area of action for ShiPP, with the Ennis Information Age Town (see chapter 7) being the main project. Others included road shows to raise the level of awareness concerning the potential benefits of the Information Society for citizens and businesses. A major media campaign, based on the notion of 'e-region' was part of the strategy.

Enterprise actions aimed to help local small businesses to use ICT in their everyday activity, by actively participating in the various learning programmes. Identification of needs to further awareness and encourage SMEs to acquire equipment, software and proper training was essential. A survey conducted in April 2000 concerning 500 small

businesses, with half located in a strictly rural environment indicated that close to 66 percent use computers in their business, an increase of more that 15 percent in two years (ShiPP, 2002: 75). Training of employees was offered by 54 percent. E-mail had increased significantly since 1998, 81 percent of companies using PCs had an email address in 2000, which represented a three-fold increase. Finally one-third of companies had their own website (ibid.)

Public Services were considered here with the requirement of an easy and personalised on-line access for all citizens to different services, irrelevant of classical administrative divisions, whether local, regional or national. This was particularly important for rural areas, where accomplishing any kind of formality often entailed a trip to the nearest city or town. These actions were grouped under the European TITAN project (Tactical Integration of Telematic Applications across Intelligent Networks), which also involved the Southwest region. The project aims in particular to create a multi-service portal, with easy access to all administrations and public bodies in the first stage and electronic transactions and delivery of official documents in the second stage.

The Southwest Regional Authority identified early on the need to give priority to the Information Society. It recognised this in its strategic plan (1994 - 2000). The strategic statement rested not only on economic considerations but also on social concerns, with the goal of bringing ICT to all citizens, both in urban and rural areas, without excluding marginalised categories such as the jobless or disabled. Thus, the Southwest could be considered a natural candidate for the European Commission RISI programme and it was selected in 1996 along with the Midwest.

In its Strategy and Action Plan of the same year its mission statement was articulated around the following four points: People First, rural and urban development; SME development; education and training; and access to public services. The pillars on which

the STAND project rests are distinctly different from those of ShiPP, here the obvious focus is on putting people first.

People First: Rural and Urban Development

The main aim of the first workgroup was to introduce the IS and its associated technologies and benefits to a broad range of Community and Voluntary organisations throughout the region. The idea was to use ICTs not only to empower people but also to enhance their ability to participate fully in every aspect of social and economic life and to demonstrate new opportunities for inclusion. The objective here naturally translated into Information Society Access Points, with financing from external sources STAND has been instrumental in helping to equip 35 communities in the Southwest with computers and basic training. Each of these locations provide free public access to the Internet and a further 200 are already planned.

Education and Training

"We want to facilitate community access to education and training and ensure that the identified needs of the communities and people across the region can be met" (STAND, 1997: 9). The emphasis here was put on bringing ICTs to groups at the greatest risk of the digital divide, particularly the handicapped. Most noted in achieving this are DATE and SOLAS projects (see below)

Access to Public Services

"We believe that ICTs should be used to make the provision of public services more customer oriented and socially inclusive with the needs and requirements of communities and the general public. Our aim is to build upon existing initiatives and to improve the delivery of enhanced public services through the use of ICTs so as to ensure quality service, openness and transparency whilst offering greater choice and convenience to all citizens" (ibid. 18). The focus here was put on the one-stop access and service within the

European TITAN project, in which the Midwest regional authority also participated and a special priority was given to tele-medicine applications.

SME Development:

"We acknowledge the importance and economic necessity for SMEs to adapt their structures to take account of international development in the use of ICTs whilst being aware of both the inherent threats and the employment opportunities. Our aim is to build the ICT and electronic commerce capabilities of SMEs through a series of awareness workshops, benchmarking trials and demonstrations of new business applications and services" (ibid.34). In terms of this and the last pillar, issues of infrastructure were raised. It was this that inspired the launch of 'Centre for Excellence for Software Development' the forerunner to the National Software Campus.

In looking at both ShiPP and STAND, we have to view them in terms of umbrella projects, under which the various projects are trying to involve as many key actors in the region as possible. So what they were really about was trying to make people aware of what was going on in the region in terms of making use of ICTs and competing in the information age:

"I think that is how ShiPP was so effective, it made people aware of how technology can affect their business and their lives for the better"

(ShiPP Project Director, Interview, August, 2002)

Each working group in both regions had their own flagship, the Ennis Information Age Town for awareness in the Midwest and TITAN for public services in the Southwest (and Midwest also). The majority of these projects were ongoing independent of RISI, but what RISI did was provide a coherence in terms of an action plan for bringing all these separate projects together and create an environment conducive to collaboration for all the main actors involved:

"At the beginning it was just a case of getting the names down of the key actors, and once people realised the amount of different and complementary things going on in the region they could not get enough"

(STAND Project Director, Interview, July 2002)

The various separate projects that come together to form the RISI project in each region had differing degrees of success. In the following section examples from each region are examined in more detail.

Under the *Infrastructure* working group for ShiPP was the Shannon Broadband initiative. A study of the state of telecoms infrastructure in the region found that poor competition, high costs, and high levels of dissatisfaction among large and small companies, characterised the telecommunications environment in the region (Mason Communications, 1999). Based on that review, a number of telecoms priorities were formulated for the Shannon Region, aimed at addressing the digital divide between the region and the East Coast of Ireland. A three pronged strategy which is now being led by Shannon Development was formed:

- Promote the roll-out of new carrier-neutral infrastructure between Dublin and the Shannon region;
- Encourage a global carrier to set up a Point of Presence in the region;
- Adopt a 'node and spoke' approach by developing a broadband backbone through the region (ShiPP, 2002: 31).

A partnership of Shannon Development and the seven Local Authorities in the region formed the Shannon Broadband Consortium and has drawn up a plan to make sure the region serves as a model for addressing the current gaps in broadband connectivity outside of Dublin. In its first step towards achieving this goal, the consortium submitted a funding bid to the National Development Plan and Department of Public Enterprise. At the time of writing no news was heard of the proposal.

Whether or not it is successful will have to remain to be seen, but what lacks success here before any physical work is undertaken, is the top-down approach the three-pronged strategy implies. In essence it contravenes the RISI ethos of bottom-up demand led approaches. This is demonstrative of the array of projects ongoing under the RISI umbrella, some of which may actually directly contravene it. Another project of note is the Ennis Information Age town initiative, chosen as a lead project for the *awareness* working group. This too suffers from the same shortcoming as the Broadband initiative, but this will be dealt with in more detail later on.

In terms of representative projects leading the different working groups, the same can be said for the Southwest. As already noted, the emphasis of the STAND project is somewhat different to that of ShiPP, as is implied by the following quote:

"STAND was about people first – so it was about the people and not the technology, and how the technology can be used as a tool for regional development and help social inclusion. Rather than making the digital divide bigger than it already was and the level of commitment and enthusiasm for it in phase 1 was enormous and people couldn't get enough of it."

(Project Director, SWRA, Interview, July, 2002)

Under the working group *education and training* the SWRA looked at a project already underway in some of the region's national schools, entitled SOLAS which was aimed at children with physical and sensory disabilities. The DATE project ensued, it obtained European funding for a total of €582,000, as well as sponsorship from major ICT companies. DATE selected a pilot group of 52 children from all over the region who were provided with the necessary hardware and software. It was considered a success because through the acquisition of computer skills the children built up their self confidence and it helped pull them out of their isolation and helped reduce their dependency. For rural purposes it opened up the possibility for handicapped children to

follow adequately and in an integrated fashion mainstream schooling in their own town. Parents thus avoided the dilemma between costly placement in a specialised institution elsewhere or accepting unsatisfactory participation in local school curricula.

"It was a great success – one of them had her condition re-diagnosed over the internet from a doctor in America – her treatment was changed and she became a different person. Plus the kids became cool."

(DATE Project Director, Interview, July, 2002)

The success of the project can be measured by the fact that the Irish Department of Education accepted it as a key pilot in developing national policy in the delivery of education to persons with disabilities.

However, not all projects in the Southwest were as successful as DATE. The flagship project of the SME Development work group, the Innovation Centre has yet to fill half the units it set aside for indigenous high potential start-ups.

The Midwest and the Southwest regions of Ireland are both actively engaged in projects to bring the IS to all inhabitants with specific policies devised to take account of the requirements of rural areas, owing to the nature of both regions. The strategies adopted by each region may seem quite different, but much of this can be accounted for by the fact that there are differences in the organisation of the different steps towards the same goal, rather than the choosing of different objectives. Differences can also be rationalised by the difference in the social and economic make-up of both regions. On one hand the Midwest appears to emphasise strongly economic development through adoption of the latest technology whereas the Southwest puts the accent on a "People First" approach. In the first case this can be understood as a proactive policy seeking to capitalise on existing strengths, such as the NTP in Limerick, to implement a new spatial development approach including rural areas and the knowledge based economy. In the second case the Southwest is seeking, through projects more centred on public service considerations, to bring the basic benefits of ICT to all people in the region.

Conclusion

The Regional Information Society Initiative is novel in the context of earlier European ICT programmes. The different approach that RISI entails can be better appreciated in the context of the two distinct theoretical approaches that were outlined in chapter two. In RISI, along with the institutional approach phrases such as bottom-up and demand-led have replaced top-down and supply-led which were ever present in former EU IS programmes under the influence of the neo-liberal approach. For this reason writers such as Morgan (2001) term RISI and other innovation initiatives coming out of Article 10 of the ERDF as the beginning of the 'institutional turn' in EU thinking and policy making.

In looking at the RISI regions and their performance we begin to appreciate how this initiative has taken on a diversity of regions. There are two reasons why the Commission might have thought it appropriate to incorporate such a degree of diversity. Firstly, while the regions are diverse commonalities also exist between them which form a good basis for collaborating. Secondly, the rationale can be explained by a mentoring ethos employed in many EU initiatives where the weaker learn from the stronger. Taking into consideration both these reasons and the rather stringent selection process in the run up to RISI, we can see that regions can learn both from other regions who may suffer from the same complaints as well as other regions that have moved beyond theirs.

Looking at the socio-economic performance of the 22 regions, we see that on the whole they do perform below the average for the Union over the period and after RISI. There are undoubtedly some outliers in every socio-economic statistic among the 22, but the general trend is below par. More positively, when we look at the innovativeness of the regions, we see that a trend below the EU average is less apparent and that there are a

considerably higher degree of outliers, mostly on the positive side. But there still exists a sizable disparity between the regions.

The disparity is somewhat less when we move on to regional interpretations of the initiative. On the whole most are very positive about RISI. They all claim it is one of the best EU initiatives they have been party to. Awareness raising and increased networking are held up as the main achievements of the initiative; unfortunately these are somewhat harder to measure than the more concrete indicators that I have referred to earlier in this chapter.

The underlying beliefs of RISI have been attained (according to the survey) but to what end? The initiative, in its current phase, began over seven years ago and its project leaders continue cite outcomes that have yet to materialise. It can be maintained by respondents that more people are 'aware' of the internet, but in the current climate, it remains almost impossible not to be. Increased networking can also be held up as a merit and however true this may be, is it not also true that networking has been on the rise before this initiative and will it not continue this rise after it?

The gap between regions is as obvious as the gap between concepts which are loosely defined and hard to measure such as networking and awareness and more tangible aspects on a region's performance, such as R&D, patenting, GDP and innovativeness. This is perhaps best described by two different quotes from an interview with one of RISI's project leaders:

> "It was novel in the sense that it bought a lot of people together that might not of been bought together. I suppose awareness was also raised, but then again, separating the effect RISI had on it from the way the world was going would be impossible. But I suppose we can claim it anyway!"
>
> (Representative of Shannon Development, Interview, August, 2002)

> "Well it is true, we do have a lot of faffing about, but is that not what networking is? But we can call it an Information Society when you are able to book a B&B, get confirmation, find out what restaurants are in the vicinity, and what their menu is like. Then you have an information society that people will appreciate... but of course we can only really have that when we get broad band"
>
> (Representative of University of Limerick, Interview, August, 2002)

Having taken a close look at the case study regions it has become clearer how differences in their regional make up not only affect the outcome of RISI, but the RISI programme itself. Looking at ShiPP and STAND, the differences appear to be more limited in scope. The Southwest also has an active approach to the dissemination of technology in a learning and business environment. While the accent put in the Midwest on awareness, whether for the general public or SMEs, is not radically different from the 'People First' approach put forward by the Southwest.

Besides, the programmes adopted by the two contiguous regions rest on strategic actions engaged in the field of wide band telecommunications infrastructure. Both regions are fully aware that a 'territorial digital divide' may stem from concentration of access points in urban areas and are taking action to avoid this. In the Midwest the driving force seems to be business oriented and in the Southwest public services requirements have initialised the process. In the end the public and private sector will both use the high bandwidth available, introducing a certain degree of flexibility in the localisation of economic activities.

Using the two Irish RISI regions as case study regions forms a springboard to the following chapter. As we have seen, the Midwest and the Southwest have performed well above the RISI (and in many cases the EU) average over the time period shown. In the following chapters the focus turns to Ireland, by then comparing the two RISI regions

with the remaining six Irish regions I can better gauge their performance in a national context. This proves interesting when the policy approach in Ireland is compared to that of the EU and RISI. Much of Ireland's 'tigerish' economic growth over the 1990s has been linked to its pursuit of neo-liberal economic and industrial policies, situating the approach and performance of the two RISI regions within this is at the core of this work.

Technical Annex

Revealed Regional Summary Innovation Index: definition

The RRSII tries to take into account both the region's relative innovative performance to the EU mean as the region's relative performance within the country. For this two indexes are calculated of which then the mean value is taken for the RRSII:

- The average of the indicator values indexed to the country mean (RNSII: regional national summary innovation index):

$$RNSII_j = \left(\frac{100}{n}\right) * \sum_i \frac{X}{\overline{X}}$$

- The average of the indicator values indexed to the EU mean (RESII: regional European summary innovation index):

$$REUSII_j = \left(\frac{100}{n}\right) * \sum_i \frac{X}{EU}$$

Where X_{ijk} is the value of indicator i for the region j in the country k, EU_i is the value of indicator i for the EU, and n is the number of indicators for which regional data are available.

The RRSII is then calculated as the unweighted average of the RNSII and the REUSII.

CHAPTER 5: IRELAND'S DEVELOPMENT AS AN INFORMATION AGE ECONOMY

Introduction

The road to Ireland's economic success of the present day has been a rocky one. So, to take the current performance of the economy in isolation of its development over the past two hundred years would be to commit a most serious form of sophistry. The nature of Ireland's development trajectory is one with many twists and turns, ones of grave mistakes mixed with wonderful foresight. It has been studied by many academics and mimicked by many policy makers in other developing countries (O'Grada, 1997; Sweeney, 2000 and Kirby, 2002). The current chapter attempts to depict Ireland's diffuse developmental trajectory which is integral to this thesis as it shows Ireland's evolution towards an Information Age economy that has seen it become the world's largest exporter of software at the end of the twentieth century. Ireland, as will be made clear, proves an invaluable test-bed, as a country (and set of regions) that has fully engaged with Information Society Technologies and the resultant impacts of this engagement on the economy and society of Ireland as a whole.

There are many different interpretations as to how Ireland found itself so well off by the start of the twenty-first century; the Nationalist view places the blame for Ireland's lack of development prior to 1950 squarely on the shoulders of Great Britain. It cites evidence that Irish economic fortunes improved once dependence on British markets ended (O'Hagan, 1995). This view is not too dissimilar from dependency theory which emphasises the harmful results of links between a centre and periphery. Another interpretation relies on the Marxist concept of class conflict; and how after the famine the rural proletariat were essentially wiped out leaving the rural bourgeoisie in their stead, which in due course wrested control over land from the aristocracy and provided the leaders of a conservative independent state (Lee, 1989).

This chapter does not abide by any particular school of thought; instead it simply highlights the major occurrences in the development of the Irish economy in the sense

that it is examined by this work. I will look briefly at the post-independence shift from protectionism to free-trade in the 1960s and the opening up of the Irish economy prior to its becoming a member of the European Economic Community in 1973. After this I will examine the making of a high-tech Ireland, before considering one of the most important facets of the countries development, Ireland's attraction of Foreign Direct Investment (FDI). I will look at what are considered Ireland's most important assets in attracting FDI before probing deeper, and asking for how long will these assets continue to attract. Before concluding I will make some reference to the recent global downturn in the high-tech sector and how it manifested itself in Ireland.

What will be made clear by the end of this chapter is that Ireland has made a huge effort to engage in the high-tech information society. The chapter will look at the policies pursued by the Irish State in attempting to achieve this goal. This will leave many questions to be answered in the following chapters such as; whether a high-tech economy can evolve organically or through the use of judicious policy making? Also in the context of RISI, whether the regions of the Midwest and Southwest will evolve any differently from the other Irish regions because of their involvement in the initiative? In the context of similar initiatives that attempt to immerse regions and countries in information society technologies; can this be driven by a social agenda or is it simply ruled by harsh economics? And finally and more generally, what is the future for the regions in an information age?

Historical Background

One event over any other characterises pre-independence Ireland; the 'Gorta Bocht', or the Great Famine of the 1850s. The famine drastically shaped the face and spirit of the Irish economy and its people. By the end of this catastrophe, over one million people had died, and another million emigrated. The land system had been greatly shaken; large numbers of landlords had gone bankrupt, and the agricultural labour class had been virtually wiped out. Small farms were being consolidated into large ones and the Irish language had begun to disappear. It also started a decline in the rural population of Ireland that continues to this day (Litton, 2003).

The blame was placed on various culprits, from British misrule, to Laissez-faire economics and Ireland's peripherality to Britain's core. Indeed the core-periphery model does go some way in explaining Ireland's relationship with Britain (Crotty, 1966) as does the work of many dependency theorists such as Sen (1984) and Amin (1977). There were many reasons given for why Ireland remained poor from insecurity of tenure, agrarian violence to the lack of capital (O'Hagan, 1995), but the fact remained that it did.

It was partly a result of this that the Irish nationalist cause began to gain momentum in the early part of the twentieth century, and by 1922, Ireland had partly achieved the goal of full independence from Britain. The new state of Ireland had an economy which approximated to that of a typical 'Third World' mono-crop type. Excluding food and drink, it was 'virtually without industries' (O'Grada, 1994, 313). The policies pursued by the first independent government, Cumann na nGaedheal under the leadership of W.T.Cosgrave were characterised by cautious continuity rather than daring innovation. Indeed, it was not until 10 years later that the Irish government put in place any independent economic or social policies. In 1932, under the auspices of Fianna Fáil (the party opposed to a divided Ireland) and Eamon DeValera, Ireland pursued policies of aggressive protectionism in a drive for self-sufficiency. Tariffs on imports rose as far as 45% in 1936 and Acts such as the Control of Manufacturing Act were invoked, which stated that 51% of the voting shares of any manufacturing company had to be controlled by Irish people (ibid.). Fianna Fáil were aware of the paradigmatic shift in economic thinking away from Laissez-faire towards the more nationalist and state-led approach of J.M Keynes, who while in Dublin in 1936 stated:

'If I were an Irishman I should find much to attract me in the economic outlook of your present government towards self-sufficiency' (from O'Hagan, 1995: 30)

The combined effects of protectionism and Economic War[1] were initially dramatic. Industrial output rose 40% between 1931 and 1936. There was a rise in industrial share issues on the Dublin Stock Market with the number of industrial concerns

[1] Fianna Fáil's refusal to pay land annuities (payments for land bought by tenants from former British Landlords) was met with an number of tariffs by the British government, most notably an 80% tariff on Irish cattle

quoted trebling and their aggregate capital doubling between 1933 and 1939 (O'Grada, 1997). Dublin and Cork had got the majority of new plants (616 out of 1,072 in a count by the Department of Industry, Trade and Commerce in 1948) and a regional geography of Ireland's development was becoming apparent.

The boom, however, was short-lived and the first 'easy' stage of Import Substitution Industrialisation (ISI) was exhausted by the early 1950s, and the Irish economy was facing the kinds of constraints that were typical of ISI in other parts of the world (e.g. balance of payments problems, inefficiencies, lack of export orientation etc). As manufacturing output grew by only 1.7% per annum between 1951 and 1958, it was clear that a fundamental change in policy was needed. It came with the liberalisation of the Irish economy in the 1950s (Kirby, 2002).

Liberalisation

The term liberalisation fits well with what happened in Ireland in the 1960s, economically, socially and culturally. In the 40 years since, one of the most easily notable changes that Ireland has gone through was the move from rural to urban. Cities and towns grew with repercussions for Irish society, such as increasing secularisation and the onset of 'progressive' values. Ireland coined its own type of liberalism, that of public attitudes, once wholly dominated by the State and Catholic Church bind. The Modernisers maintained that liberal-minded people left the countryside to live in the enlightenment of the city, the reality was that what was termed 'liberalism' was a phenomenon with a distinct urban geography associated with only the affluent parts of the city. Liberalism in its cultural and social guise in Ireland was more associated with attitudes towards sexuality and religion, and was a label that was adopted by many in opposition to Irish traditionalism.

Fianna Fáil were back in power by the late 1950s, and had little problem in following this rising wave against Irish traditionalism. The economic policies of two decades previous, economic polices with cultural undertones, were cast aside, and the Irish economy went from being highly protected to very open in a matter of months.

"In the matter of dropping protection at least, Ireland went so far down the road of liberalisation, that it would be hard to ever find our way back"

IDA representative (Interview December, 2002)

Economic liberalisation has its roots firmly based in the 1950s. The Coalition Government (comprising of Labour and Fine Gael) of 1954 – 1957 began to talk to the IMF and World Bank. These international financial institutions were influential and persuasive in Ireland's economic opening up. Politicians and others began to wake up to what was happening in neighbouring countries. By this time, Keynesian expansionism had become acceptable, and Ireland had received IR£150 million in aid under the Marshall Plan (Foster, 1989). The Industrial Development Authority (IDA) was set up in 1949 and by 1956 politicians had began visiting the headquarters of large multinationals in an attempt to entice them to set up in Ireland. They primarily targeted US firms, especially those with Irish roots; playing the 'homeland nation' card in this way worked well for Ireland.

O'Hagan (1995) argues that the 1950s can be considered more a period of transition, one which saw Ireland reorienting itself to the export market, a transition that was bound to take some time. A key year in this transition was the publishing of the now celebrated report 'Economic Development', by T.K. Whitaker in 1958. Recognising the recent poor performance, characterising agriculture as 'backward', noting the small scale of industry and diagnosing private capital as scarce and timid, the report called for a reorientation of government investment towards more 'productive' uses and away from a primary emphasis on 'social' investment (such as housing). It proposed that tariffs should be dismantled unless a clear infant industry case existed and favoured incentives to stimulate private industry. What is most remembered from the report is that it struck an optimistic note in pessimistic times (Sweeney, 2000).

Liberalisation took place in three elements: firstly, the use of grants and tax concessions to encourage export-oriented production; secondly, the attraction of foreign manufacturing enterprises; thirdly, dismantling protection in return for greater access to markets abroad (Kennedy et al, 1988).

It was the second which assumed dominance. As O'Grada put it:

> "At the outset few foresaw the rapid growth of the foreign sector, but direct foreign investment in Irish industry soon became the cornerstone of government policy...The remarkable transformation of the economy between the late 1950s and the early 1970s may be largely attributed to the arrival of the multinationals" (1997, 114).

The third phase since the late 1960s characterised by more sophisticated products such as machinery, pharmaceuticals, instruments and electronics. Ireland was the first country to establish what came to be known as an export processing zone (EPZ) when the Shannon Free Airport Development Company was set up in 1958 in the Midwest region. This State-backed industrial zone handed out special incentives to attract foreign investors to import materials which underwent some degree of processing before being exported again. This was one of the main pillars behind the government's foreign investment-led, export-oriented industrialisation strategy. These are seen as a key tool of development in an increasingly globalised world. With the trend towards decentralised production, an EPZ can serve as a link in a global production network. The relative success of this outward looking development tool is testified by their recent proliferation across Eastern European countries in the last decade.

By 1973, overseas firms in Ireland accounted for almost one-third of all employment in manufacturing (68,500 out of 219,000). By 1983, there were almost 1000 foreign firms in Ireland and they had invested well over £4 billion in the country; half of them came from the US, one-eighth from Britain and one-tenth from Germany (O'Grada, 1997, 115). Between 1958 and 1973, manufacturing output grew by 6.7% per annum while manufacturing employment grew by a more modest 2.4% per annum (O'Malley 1992). Exports as a percentage of gross output grew more dramatically, from 19.4% in 1960 to 41% in 1978.

It was around this time that Ireland began to realise the problem of regional development. The Undeveloped Areas Act of 1952 allowed for grant aid for new industries in designated areas and this recognition of the need for rural industrialisation gradually evolved into a policy of regional balance through which the

state sought to reduce regional disparities by providing industrial jobs as near as practicable to job seekers (O'Tuathaigh, 1986). However, instead of any attempt to promote a policy of industrialisation based on local linkages through the processing of agricultural inputs, the state opted instead to encourage multinational companies, through grants and subsidies from the IDA to locate in rural areas. This met with a measure of success in locational terms: by 1973, 59% of foreign firms which located in Ireland following the liberalisation of the economy in the early 1960s were established in the designated areas (Breathnach, 1985, 178). However, by the nature of this type of industrialisation, backward linkages in terms of purchasing and sub-contracting to indigenous firms were weak.

With a panoply of tax breaks and subsidies, Ireland successfully induced foreign companies to set up branches in Ireland, and by 1974 new industry accounted for over 60% of industrial output. Indeed the 10% tax on profits in manufacturing has now made the country something of a tax haven.

The final thrust of government policy was wage restraint, viewed as necessary, especially with a fixed exchange rate, to help keep industrial costs at a competitive level and insisted on by the World Bank. In the 1960s government efforts amounted to exhortation. In the 1970s wage bargaining was centralised, under the National Wage Agreements. Given the option of emigration, the scope for manoeuvre here was small. If real wages were pushed below the British level that would simply stimulate faster emigration and so could not be sustained (O'Grada, 1997; Allen, 2000).

The EU in 1973

The epitome of liberalisation in Ireland was its accession to the European Economic Community in 1973. First rejected in 1964, Ireland along with the UK and Denmark, was accepted seven years later. The initial rejection had sparked Ireland into increased liberalisation. Tariffs were unilaterally cut in 1963 and 1964, and the Anglo-Irish Free Trade Area Agreement was signed in 1965. Add to this the subscription to GATT in 1967 and Ireland had put itself in a much more favourable position to join the EEC by opening itself up to freer trade.

Joining the EEC marked a turning point in Ireland, not just economically, but socially and culturally as well, as the country has since turned increasingly towards the European Union, and correspondingly less towards the UK, in its external relations. There were two immediate and important implications of membership for Ireland: lower trade barriers, and the Common Agricultural Policy. By joining Ireland had committed itself to freer trade and by 1977 most tariff barriers were removed. With these lower barriers it was predicted that Ireland would become a good platform from which companies from outside the EEC could serve the European Market (O'Hagan, 1995).

These expectations were met: while Irish exports amounted to 34% of GDP in 1963 and 38% in 1973, the proportion had risen to 62% by 1991. As expected the destination for exports also changed, with a falling share going to the UK (down to 32% in 1992) and with a rising share going to other EU countries (rising to 43% by 1992) (IDA, 2000). What accession to the EEC did was make Ireland even more attractive to American multinationals, as Ireland was seen as a platform to compete within Europe (see below).

> "The US has always been our major focus. When we started in 1970 we had to make our own rules, over time we have garnered a lot of expertise in how to go about it. So instead of just taking every industry that came our way, we have been honing and refining our method as we go along we have an annual conference every year going on over seas and local people get together in Dublin for a session of brainstorming to find out what we should be doing for the coming year, and because we are a small organisation and a small country we can change quite rapidly and that is good for us. We find that companies coming in have a very positive view of us"
>
> Regional Director of the IDA (Interview, July, 2002)

Without doubt one of the dominating economic features of the 1970s was the oil crises. In response, the government was thoroughly Keynesian in its attempt to pump-prime the economy. The higher price of oil meant that spending was diverted towards

imports, thereby depressing aggregate demand for Irish goods and services. The solution adopted was to boost government current spending, and as a consequence the current budget deficit rose from 0.4% in 1973 to 6.8% in 1975 (Meyler, 1998).

With the passing of recession came the appropriate adjustment calls for lowering the budget deficit, and indeed it fell to 3.6% of GDP in 1977. But in 1978 the new Fianna Fáil government, worried about persistent unemployment, strongly boosted government spending again. This spending was pro-cyclical, and initially had every appearance of success, with rapid economic growth, a reduction in the unemployment rate (to 7.2% in 1979), and significant net immigration for the first time in a generation.

The costs came with a lag. The government had to borrow heavily, and by 1986 the cost of servicing this debt took up 94% of all revenue from personal income tax. Successive governments initially tried to solve the problem by raising tax rates, but this hardly increased tax revenue, suggesting that the country was close to its revenue-maximising tax rates. Much of the additional spending went to buy imports, and the current account deficit widened to an untenable 15% by 1981. Partly as a result, the punt was devalued four times within the European Monetary System in the early 1980s. Between 1979 and 1986 GDP rose by just 1.5% annually, and Gross National Disposable Income per capita actually fell. The great experiment in fiscal expansion had failed (Barry et al, 1999).

Ironically, the new Fianna Fáil government, after criticising the previous government's austere proposals, introduced a very tight budget in 1987, cutting the current budget deficit to 1.7% of GDP. Capital spending was also sharply cut, and by 1992 the ratio of debt to GDP had fallen below 100%. This return to fiscal rectitude was accompanied by a resumption of robust economic growth. Some have argued that this amounted to an expansionary fiscal contraction (Sweeney, 2000). The idea is that private investors and consumers, convinced that the government was serious, resumed their spending and triggered a boom. The truth is somewhat more prosaic. The drop in government spending was mainly replaced by a boom in exports, due in part to the 11% devaluation of the Punt in 1986, along with continued wage restraint which enabled Ireland to become more competitive (Kirby, 2002).

Since 1960 the core of the Irish model of growth has been a set of financial inducements to foreign manufacturing industry to set up in the country. On the surface this worked well, and industrial employment rose from 164,000 in 1962 to 227,000 in 1980. During the 1980s the cracks became more evident, as industrial employment fell to 195,000 by 1991. Companies footloose enough to set up in Ireland were also likely to be footloose enough to leave. The policy paid more attention to attracting firms than to strengthening domestic enterprises, and by 1992, 46% of industrial jobs were in foreign firms. The costs also became more evident; direct subsidies were estimated at 3% of GDP during the period 1983-6, equivalent to almost an eighth of industrial value added, and rose to IR£600 million in 1991. With the exceptions of Greece and Italy, Ireland subsidised industry much more heavily than other EU member states. As implemented, the policy had a strong bias in favour of using capital rather than labour, because it subsidised capital and not labour. Until the mid-1970s it also explicitly favoured the creation of jobs for men rather than women (O'Malley, 1992; IDA, 1995).

In recognition of the shortcomings of Irish industry the White Paper on Industrial Growth (better known as the Culliton Report) was produced in the early 1990s. The report was influential and seen as a good follow-on from the Telesis Report published 10 years earlier. It was viewed as a success and seen as a panacea to Irish industrial ills. Responsible for dividing state agencies dedicated to indigenous and foreign industries, it was not without its critics:

> "The 1993 Culliton report culminated in the break up of the IDA into two agencies, Enterprise Ireland and IDA Ireland, responsible for indigenous and international business respectively. Alongside this came the creation of county enterprise boards, a move mirrored in the Six Counties (Northern Ireland) without any expert report! After that, the trail went dry and nothing more seemed to happen. One possible reason is that the economic boom of the Tiger economy years intervened and the Irish economy, driven by the international one, didn't need its own economic strategy."
>
> Galway County Development Board Manager (Interview, May, 2002)

What did follow was what has been labelled the Celtic Tiger, undoubtedly the most spectacular boom period ever experienced in the Irish economy. However, to say that it was simply an accident of policy would be to underestimate many of well placed government expenditures that went on in the decades prior to the 1990s. Ireland had invested heavily in education and training and had a surplus of well qualified graduates by the 1990s. While the greater proportion of industry prior to 1990 was low-value added operations, Ireland had been trying to target higher-value operations as well as services.

The evolution of Irish policy making can be traced along similar lines to the evolution of theory set out in chapter 2. From protectionism in the 1930s and 1940s and the nationalistic approach to development to the liberalising and laissez-faire route taken in the 1960s and 1970s, Irish policy makers have been in close pursuit of evolving development theory. Ireland stands out because of its unique approach to liberal economic policies, so while Ireland has become one of the most open economies in the world this is a result of direct state intervention through state agencies such as the IDA. This unique approach has been instrumental in bringing about the economic turn in fortunes of the 1990s.

As a set of policies, the Irish approach can be seen as almost directly contravening the approach espoused by RISI as outlined in the last chapter. Where RISI calls for a demand-led bottom-up approach, Ireland followed a more supply-led top-down approach through its provision of subsidised locations in purpose built industrial parks and the provision of labour with subsidised wages (see next chapter). The development path pursued by the country has also had appreciable effects on both RISI case study regions. The Shannon region with its export processing zone, as we have seen has become heavily dependent on the multinational sector, and while the southwest is more traditional, it too has a significant presence of multinational companies, which have had an effect on the region's development. The question still remains, which method will be more effective in bringing the regions into the Information Society?

The Golden Era: Ireland in the 1990s

The decade of the 1990s proved to be something of a golden era for the Irish economy. The country experienced unparalleled levels of economic growth at the same time as which it saw unemployment levels plummet, inflation levels stabilise and inward investment increase at a substantial rate. Table 5.1 uses GDP growth rates to illustrate the emergence of the 'Celtic Tiger', which saw the rapid transformation of the Irish economy from one with a per capita GDP of just 63% of the EU average in 1987, to one which actually exceeded the average ten years later.

It is the rapidity of change that makes the Irish case noteworthy. Considering the poor state of the economy in the 1980s it is of little surprise that many other European nations/regions now seek to emulate this rapid transition from relative stagnation to relative prosperity. The contrast is stark; 1980s Ireland was characterised by high levels of emigration, unemployment rates that staggered around 18%, little economic growth exacerbated by double digit inflation. By the end of the 1990s, unemployment was down to 5%, whilst Ireland shifted from a country experiencing net out-migration to one experiencing net in-migration, employment was growing strongly and government finances were in surplus (Breathneach, 2000b).

Table 5.1: Percent growth of GDP Ireland 1992 - 2000

	1992	1993	1994	1995	1996	1997	1998	1999	2000
Ireland	4.0	3.1	6.8	9.8	7.8	9.5	10.4	8.7	9.9
EU	1.0	-0.5	2.8	2.4	1.6	2.3	3.0	2.2	3.6
US	2.7	2.3	3.5	2.0	2.4	3.6	4.0	4.4	4.9
Japan	1.0	0.3	0.6	1.4	3.6	2.3	1.6	0.3	1.7

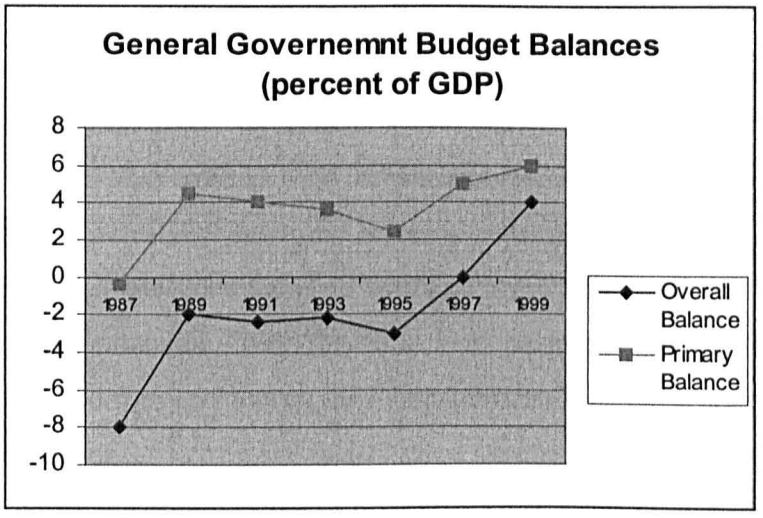
Source: Breathnach 2000: OECD 2000

This strong performance has been attributed to a wide range of factors, from EU structural funds, social partnerships on wage agreements between the government, trade unions and employers, to increased inward investment. It is the type of inward investment that was attracted that has been fundamental to the newfound prosperity. The conscious focus on the software industry has been pivotal, enabling the country to become the highest exporter of software in the world, exporting over €8bn worth of

products annually. Ireland's success has been achieved by attracting two forms of export-oriented foreign direct investment. Both of these are increasingly important due to globalisation trends in the software industry: software product manufacturing and localisation (translations and local adaptation) plants and software development centres. As we shall see in the following chapter the former far outweighs the latter. Localisation can be seen as a somewhat lower-value added activity whereby software products are adjusted to local user needs i.e. language specifications. In Software Development Centres a much higher-value level of activity takes place including research and development of new software. Ireland has benefited from its position on the periphery of Western Europe, one of the largest software markets in the world, to emerge as a key production location for US transnational corporations. Its position within 'Fortress Europe' along with the widespread use of the English language has made Ireland very attractive to investors in the US. I will deal with this in greater detail in the following chapter.

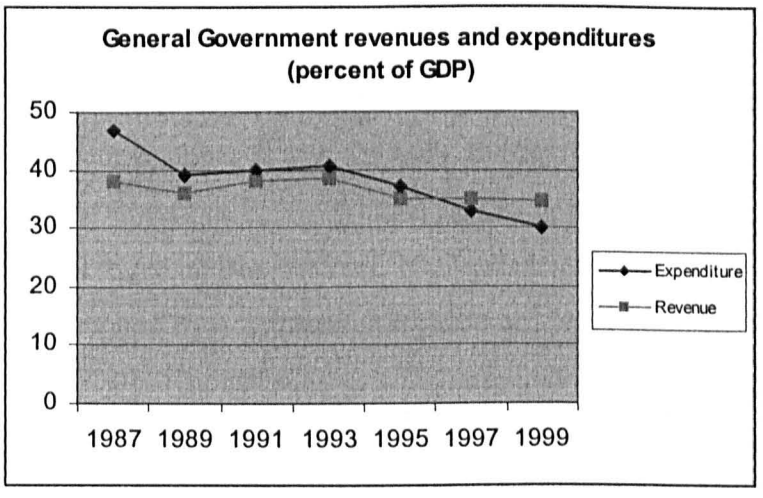
The dramatic improvement in Ireland's economic performance over the 1990s has been associated with an equally dramatic strengthening in public finances. Since 1987, the general government balance has shifted from a deficit of about 8 percent of GDP to a surplus of almost 4 percent. Over the same period, the public debt to GDP ratio has been more than cut in half. Ireland's increasing wealth is also indicative of the evolving strength of public finances in Ireland. Figure 5.2 shows that relative to GDP figures we see that current expenditure has decreased from 31 to just over 21 percent of national GDP, bringing the current balance from –1.1 to 6.2 percent from 1993 to 2000. Total expenditure relative to GDP has decreased by 8 percent, raising the exchequer balance form a deficit of –2 percent of GDP in 1993 to +2.2% in 2000 (see figures 5.1 and 5.2).

Figure. 5.1 Budget Balance



Source: Oireachtas (2000)

Figure. 5.2 Government Revenue and Expenditure



Source: Oireachtas (2000)

Three broad phases of fiscal consolidation can be identified after the coming to power of Fianna Fáil in 1987.During the first phase – 1988-89 – the general government budget balance improved by 6.5% of GDP, and the primary balance moved sharply into surplus, reaching 4.75% of GDP by 1989. This was largely achieved through cuts in public expenditures such as the public sector wage bill. The revenue to GDP ratio

declined by almost 3 percentage points, as the effects of a tax amnesty in 1988 and relatively buoyant economic growth were offset by cuts in effective income tax rates.[2]

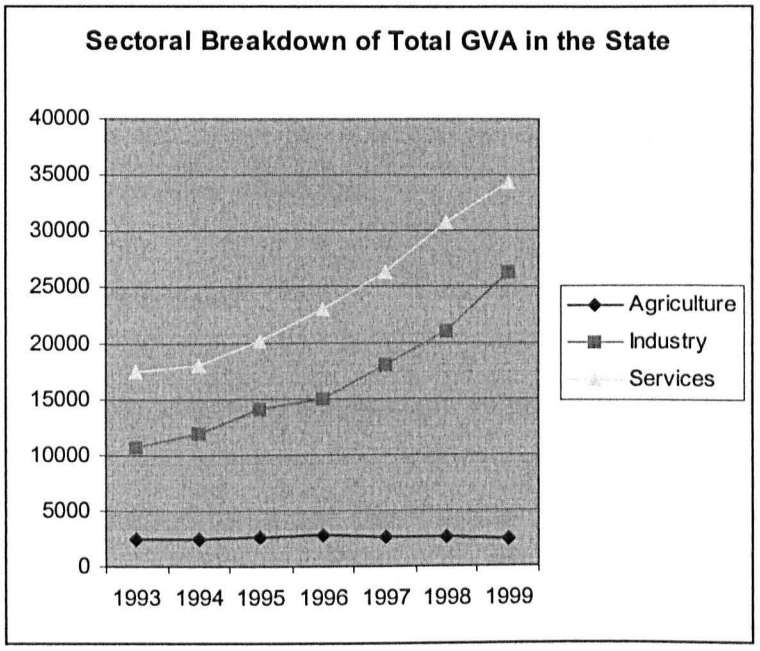
The pace of fiscal consolidation slowed markedly during 1990-95, as the overall general government balance weakened by about 1 percent of GDP, and the primary balance declined by almost 2.5%. However, the deterioration in the overall fiscal position was limited by a substantial decline in interest payments, reflecting both a falling debt-GDP ratio and lower interest rates. 1996 marked the beginning of a third phase in the consolidation process, which saw a further dramatic improvement in public finances. Over the four year period, 1996-99, the overall budget balance, adjusted for pre-funding for future pension funds and once off factors, [3] shifted from a deficit of 2.5% of GDP in 1995 to a surplus of around 3.75% in 1999, a swing of 6.33 percentage points (Sweeney, 2000).

Industrial output and productivity broke records for the State in the 1990s. The trend for industry and services are demonstrative of the same phenomenon of the development of the Irish economy. For the most part Ireland missed out on the industrial revolution of the 19th century, content with supplying Britain with its agricultural produce the economy stayed afloat. This was not a choice made by the Irish people rather it was the only alternative owing to the country's geography and colonial power relations. Ireland lacked coal or iron ore in any great quantities, and instead relied on peat for fuel. 100 years later industry has become more footloose and is less bound by geographical restrictions. Heavy industry is being replaced by lighter, more flexible industry, all of which has proven to be to the benefit of Ireland.

[2] The coincidence of budgetary consolidation and buoyant economic activity has been interpreted by some as evidence of an "expansionary fiscal policy" (McAleese and Foley, 1991). There is little doubt that the expenditure-based consolidation contributed to its durability and credibility. However, an alternative view puts more emphasis on other factors, including a favourable external economic environment, which helped to offset the adverse short-term effects on demand of fiscal consolidation (see for instance, Bradley and Whelan, 1997)

[3] Beginning in 1999, the government decided to set aside 1 percent of GNP per annum for the pre-funding of future pension liabilities. This set-aside is treated as an expenditure item in official budget figures. The once-off factors refer to the costs of discharging the future pension liability in respect of pre-1984 service of employees of Telecom Eireann and An Post

Figure 5.3 Sectoral Breakdown of GVA 2000



Source: Adopted from CSO, 2001

Figures 5.3 shows the rising importance of both industry and services in the Irish economy which have grown significantly over the decade of the 1990s. This is demonstrative of the huge inflows of foreign investment into manufacturing. With incentives such as low corporate tax and a highly educated English speaking labour force Ireland became a prime destination for lightweight assembly plants. The vast majority of these were U.S. owned high technology assembly plants. Industrialisation had come late to Ireland, but when it did it was a leaner and cleaner high tech industrialisation.

Turning our attention to the Services sector we can see that it, like the industry sector, saw total GVA increase dramatically over the decade of the 1990s. However, this sector does differ from the industry sector when we look at the percentage share it contributes to total GVA in the State over the 1990s. For the period 1993 to 1999, the service sector's share of national GVA decreased by over 1%.

Within the services sector there are some sub-sectors of importance, not least the wholesale and retailers and the educational and health groups. Financial services also

account for a great share of output from this sector, a share which has grown with the economy over the 1990s. An explanation of the falling share of GVA from Services could be derived from the fact that a significant part of this sector is taken up by public services, such as health, education and defence. These have traditionally been low value added sectors whose contribution would not be as volatile to the state of the economy as other subsectors.

High tech Ireland

Ireland has long seen the strategic value of developing a software industry, and the country has now become one of the most important centres for software development and production in Europe (see Chapter 6). Due to the judicious targeting of foreign investment, Ireland's software sector has grown from employing a few hundred people in the 1980s to an industry that in 2000 employed some 30,000 staff, accrued revenues of US$9,558m, of which US$8,502m was derived from exports, and produced over forty per cent of all the personal computer software products used in Europe (National Software Directorate, 2001). The following table highlights some of the facets of the new 'high-tech' economy of Ireland.

Table 5.2. Ireland's Information Age measures

Measure	Ireland
Population (1999)	3.8 million
Average annual growth in GDP, 1990-97	6.5 %
Inward FDI as % of gross domestic capital formation (1995)	24.0
Number of Patents filed in 1995	45,587
High tech exports as % of manufacturing exports (1996)	62
Internet hosts per 1000 people	90.9
R&D scientists and engineers per million people 1981-95	1,871
Revenue from the software industry (1993) 2000	($2,530m) $10,150m
Number employed in the software industry (1993) 2000	(7,793) 30,000

Source: National Software Directorate, (2001)

As we have already seen, through its use of industrial grant packages and Shannon's export processing zone, Ireland has explicitly pursued export-oriented economic development strategies through the attraction of foreign direct investment (FDI) since the 1950s. While it had some success in attracting manufacturing FDI, the focus shifted during the 1980s to upgrading the quality of this FDI to include more collaborative, research-based projects and service sector activities.

The significance of the role played by the government through the IDA (Industrial Development Authority), from the 1950s to the present day cannot be underestimated. Following the earlier period of import substitution industrialisation, the formation of the IDA was a key move in the attraction of FDI from the 1960s through to the 1990s. It was also the setting up of the National Software Directorate in Ireland in 1991 which proved crucial for enabling the growth of the IT sector in Ireland. Very much related to this, and coming at the behest of the IDA, is the controversial corporation tax[4]. This proved to be a very attractive deal for foreign investors in a variety of sectors, including the IT industry.

Other prime factors in the case of Ireland are:

- The strong commitment on the behalf of the IDA to foster economic growth by developing human capital through interventionist education policies.
- Heavy investment in transport and communications infrastructure (predominantly EU funded) and the establishment of cost-effective distribution networks for exporting a variety of products to European markets.
- The state-of-the-art digital telecommunications infrastructures, with over 75 per cent of users connected to digital exchanges in Ireland, whilst there is also a direct optic fibre link to the US (National Software Directorate Ireland, 1998 in Coe, 2000)

There is a clear rationale behind the Irish development trajectory; the focus on Information and Communication technologies was no accident. Flexible production

[4] This tax was set at 10% in Ireland, making it very favourable in comparison to the rates of 20 and 25% in the UK and across Europe

techniques were ripe for exploitation in Ireland with its appealing tax incentives and highly qualified workforce.

Why Ireland? - The FDI success story

It would not be an underestimation to state that Ireland's success as a destination for foreign direct investment (FDI) goes back to the Whitaker Report (1958) in the first instance, and secondly to the opening up of the economy in the 1970s. The low labour costs, low tax rates, and trade agreements with Europe were also key determinants in attracting foreign investors. Ireland realised the positive effects of FDI early on and as a consequence has seen FDI into Ireland increasing since the 1970s. By the 1990s it had the highest amount of FDI per capita in the world and one of the highest rates of FDI inflows as a percentage of GDP (Green et al, 2001).

The US was the major origin of FDI coming into Ireland, indeed over the period, 1982 to 1994 US FDI into Ireland accounted for over 3.3% of all additional FDI into the EU (this compares to a population of 1%). Ireland has been particularly successful in the areas of electronics and chemicals, attracting 5.9 and 8.7% in each sector respectively. The knock-on effects of these figures have changed the shape of Irish industry. In terms of employment, the share of those employed in foreign firms has risen significantly, from 37.6% of all manufacturing and internationally-traded services in 1979 to 46.3% in 1995 (Meyler, 1998). This corresponds to a drop from 154,900 in 1975 to 127,100 in 1995 in those employed in indigenous Irish industries. FDI has also helped change the composition of Irish industry through an increased emphasis on the high tech sector, which has bought with it a relative decrease in the number of traditional industries. Foreign-owned employment increased over the same period by 100%, and while employment in indigenous industries also increased it was only by 50%. US FDI accounts for 64% of employment by foreign companies (IDA, 2003). Foreign companies also account for 54% of total Irish output, this percentage again being significantly higher in the electronics sector, where the figures rise to 91% (ibid.).

The Three Jewels in the Irish Crown.

Three factors stand out above all others as being the key drivers behind Ireland's economic boom of the 1990s: The People; the Government; and Europe. Owing to the high unemployment rates Ireland suffered in the 1980s, by the 1990s the country had an abundance of relatively cheap labour. Add to this the fact that the education policies put in place in the 1960s were beginning to pay dividends, leaving Ireland with a young, well-educated and cheap labour force. The government was obviously instrumental in the aforementioned education policies, but perhaps of more relevance here is how they managed to attract and keep huge FDI packages through all manner of incentive packages, not least, a very low corporation tax. Finally, Ireland's membership of the EU has proved crucial in two ways; firstly as a benefactor of EU monies in the form of structural funds and secondly through its place in the single market of Europe.

The People

> "When we weighed all of the factors involved, Ireland was the clear winner ... salaries are as much as 50% lower for a workforce that is younger and better educated than elsewhere, many with second and third languages"
>
> MIS Director, Gateway Corporation PLC (Interview, July, 2002)

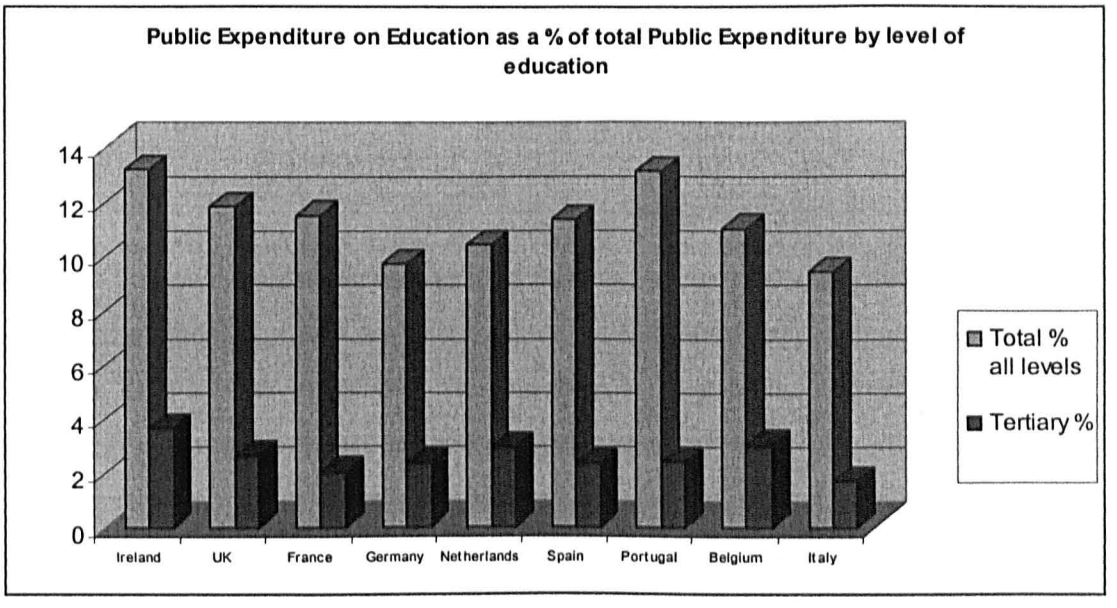
A key incentive for MNCs to locate in Ireland has been the high-skilled low cost characteristic of the Irish workforce. Irish workers speak English, are well educated, and for most of the 1990s were among the cheapest labour in the EU. Ireland's education system is ranked among the best in the world, with one of the top five executive business schools in the world. Some 65% of the population aged between 5 and 29 are enrolled in various levels of education, while the number of students enrolled in third level education has quadrupled since 1970. What is also important are the subject areas that students are choosing, with over half of college graduates obtaining degrees in computer science, engineering, science or business; subject areas

more tailored to the type of sectors that Ireland has targeted. Indeed, comparing the increase in the number of students entering third level education in Ireland in 2001 with 1992, we see that there has been:

- a 16% increase in the numbers studying Science/Applied Science courses;
- a 35% increase in the numbers studying Engineering/Technology courses;
- a 16% increase in the numbers studying Business/Administration courses.

Figure 5.4 below shows the emphasis put on education by the state, through comparative levels of investment in it.

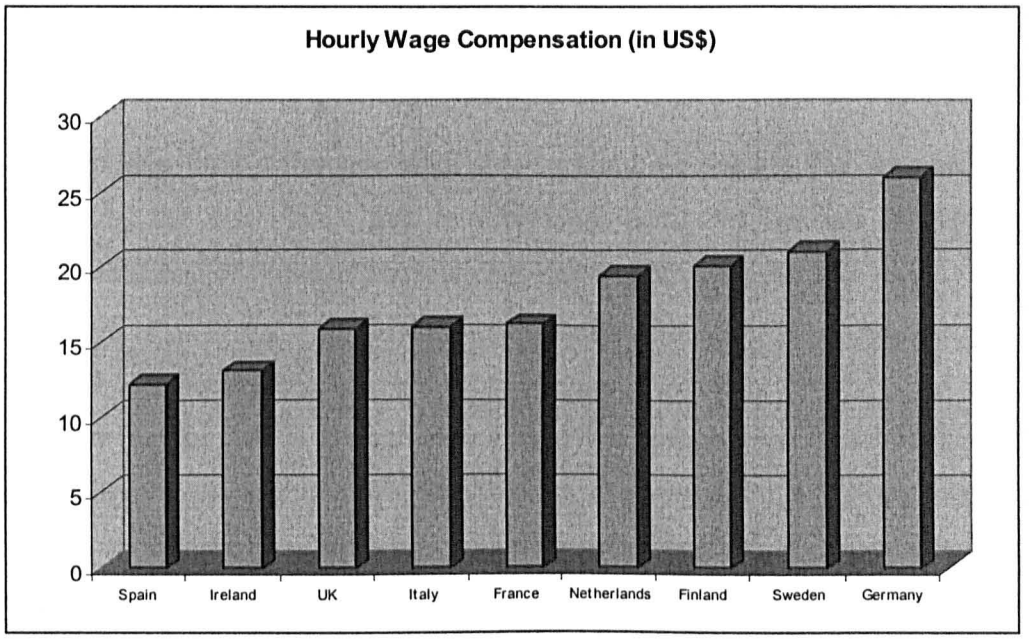
Figure 5.4 Education Spending 2001



Source: Education at a Glance, OECD 2002

We can see that when we compare Ireland to its European neighbours, it is the country that dedicates the most of its public monies to education, with a specific emphasis on tertiary education. It is money well spent, because for some time now, Ireland has realised that its comparative advantage actually lies in its well educated English speaking labour force.

Figure 5.5 Wages (2001)



Source: IDA Ireland (2002)

Figure 5.5 shows Ireland second only to Spain in terms of wages, both of which are a step behind the UK, Italy and France and in Germany the average wage is nearly twice as high as that in Ireland. The program for National Recovery in 1987 had a great deal to do with making Ireland competitive in terms of its labour costs. A series of national agreements followed this in which workers agreed to accept lower wage increases in return for tax cuts that provided a significant increase in take-home pay. This proved to be of as much benefit to employers as it did to their workers (Ruane and Gorg, 1997)

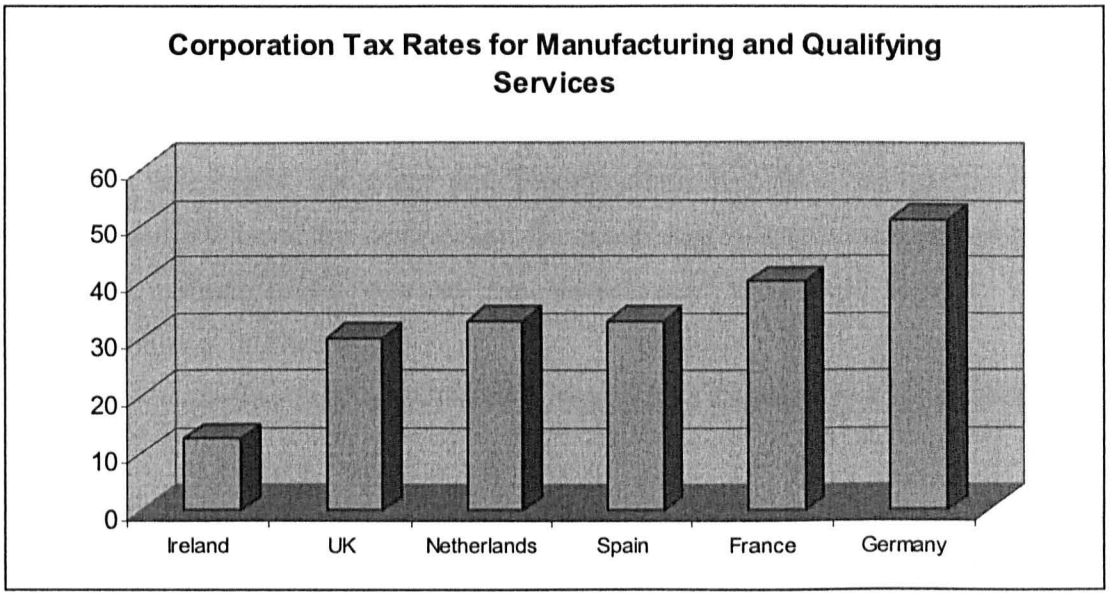
Government: lower taxes and less bureaucracy

> "It makes little difference what shareholding a company has, Ireland tends to be one of the last places that multinational firms cut because of the cash flow implications of it due to our low corporation tax"
>
> IDA Executive Director (Interview December, 2002)

As early as the 1970s Ireland recognised the importance of attracting high-tech, knowledge-intensive industries. The focus was on attracting US firms to make use of Ireland as a platform to serve the wider European market. The government took one further step in attracting foreign investment when it introduced a low tax rate of 10% for international manufacturing companies in 1981. For some time Ireland had two corporate tax rates. Activities within the Shannon airport zone, the Dublin International Financial Services Centre (IFSC), and all manufacturing activities were taxed at a rate of 10%. Other corporate taxes in Ireland were as high as 25%, but this rarely applied to multinationals as the Irish government placed a very liberal definition on 'manufacturing'.

The dual corporate structure within Ireland was considered unfair favouritism by other EU countries and also by domestic companies that did not qualify for the lowest rate. In response the government set a new tax rate of 12.5% that came into effect for all trading sectors on December 31st, 2002. All higher tax bracket activities were lowered to 12.5%, and the rate of 10% is to be phased out over a longer period of time. Although the new rate is an increase, it still remains significantly below the rate in the US and other EU countries. Indeed, for the most part it seems to be simply a concession to indigenous industry, bringing their rates down, rather than a move to beat anti-competitive behaviour. As figure 5.6 shows Ireland still remains very attractive in terms of corporation taxes charged.

Figure 5.6 Corporation Tax rate in Europe



Source: Deloitte and Touche (2002)

Regarding other taxes, Ireland once again comes out very favourably in terms of local taxes and income tax. Regarding the former, Ireland remains second only to Greece in the EU, with local taxation under 3%. Income tax rates, which are sometimes a concern for the management of MNCs because of their effect on the relocation of employees are also very low in Ireland at 24% for the first €20,000 and 46% on the balance, Ireland has income tax treaties with most industrialised countries, which allow for foreign-taxed income to be deducted from Irish incomes (IDA Ireland, 2002). In recent years Ireland has also turned towards non-financial incentives for businesses, namely reducing red tape with the recently launched programme 'Reducing Red Tape: An Action Programme of Regulatory Reform in Ireland' the government placed responsibility on each department or office to revise, consolidate, or repeal 'frivolous laws' within their jurisdiction, especially those that hinder market entry (NESC, 1999) In addition, Revenue has made an effort to reduce the red tape involved with tax payments by consolidating taxes, creating electronic payment options, and maintaining high levels of customer service. In all, Ireland made a conscious effort to sell itself and it continues to do so.

The European Union

> "The low cost way to support European customers is from a single site. This enables overheads, inventory and accommodation costs to be minimised. Dell pioneered the trend by centralising European logistics and customer support in Ireland, which offers one of the lowest cost and most flexible working environments in Europe"
>
> Representative, Dell Computers Ireland (Interview, August, 2002)

Ireland's decision to join the EU and later the European Monetary Union (EMU) has been a third crucial factor in attracting foreign investment. Over 47% of Ireland's exports are destined for the EU, with only 21% destined for the UK, this shows a massive turnaround for the Irish economy (O'Hagan, 1995).

As can be seen from the above quote, Ireland's position within 'Fortress Europe' is one of its major selling points to companies outside the EU, most notably American firms. Initial fears from non-EU companies that the EU would raise tariffs in a protectionist style, to help its domestic industries may have proven unfounded, but it proved to be enough to make them set-up a presence within the boundaries of the EU.

Ireland's adoption of the Euro along with ten other European states has also helped improve its position. The initial benefits of this are readily identifiable in terms of transactions costs and easier comparability of respective costs between the Euro states. This has made Ireland more attractive to European multinationals as their presence in the Republic increased with Ireland's passing of the tests for EMU.

One other thing that Ireland managed to achieve is a degree of symbiosis between looking to America and Europe. At the outset of Ireland's membership of the European Community it was possible to argue that much of the US interest in investment in Ireland was as an English-speaking base with access to the European market. Simultaneously, Ireland's huge success in attracting high-tech and

information-oriented industries and services is both a product of, and a cause of, an extraordinary achievement in deepening its relationship politically, diplomatically and economically with the US, while also embracing European integration (O'Donnell, 2000).

Costume Jewellery?

Although Ireland has done well by using these three factors to attract foreign direct investment a question looms over the value of these jewels. While Ireland has a well educated labour force that has been bought about through investment in education, what has become worrying is how long this investment will last:
"University cutbacks prompt outrage" Irish Independent August 22nd 2003

"University cuts will drive the best researchers abroad" Irish Times August 23rd 2003

In the same year the Minister for Finance decided to halt the proposed investment in Irish education and opt for re-introducing third level fees. Simultaneously, the numbers of student applying for Science course and IT courses in particular have dropped significantly, bringing about the closure of one IT degree course in a University in Dublin. The closure of the Centre for Software Engineering (CSE) in Dublin City University (DCU) was described as a major setback for the high-tech industry in Ireland (Irish Independent, December 2003). A brief announcement from the CSE described how the shutdown had come about due to "changing circumstances within the software industry". Twelve jobs were lost due to the closure, including that of the centre's director.

At the same time national wage agreements are coming under a notable degree of strain. With low unemployment figures and inflation beginning to rise (nearing hyper-inflation in the housing market), wage demands are now on the increase. While wages have been on the rise the recent increase in the number of strikes taking place (in 2002 and 2003 those of the nurses, bus drivers, secondary school teachers, construction workers) there is a noticeable tension between the workers and their employers. This tension rose throughout the 1990s, leading to the first arrests under the Industrial Relations Act in 1998. The law, which had been introduced in 1990 by Bertie Ahern,

was modelled on a number of anti-union laws in Britain which curbed the rights of the workers to strike (Allen, 2000). In 2003, Ireland lost 10,600 industrial jobs whilst over 29,000 working days were lost during the second quarter of that year due to industrial disputes, up from 9,666 in the second quarter of 2002 (Irish Independent, September, 2003). This is a fact recognised by the leader of the small firms association:

> "Our business model no longer reflects the needs of a competitive economy. If we continue to pay ourselves more than our competitors, then our competitors are going to take our jobs in their thousands"
>
> SFA Director (Interview August, 2003)

With respect to tax incentives, many studies show that while a high corporate tax may deter foreign investment, the reverse is not necessarily true. Studies by the Foreign Investment Advisory Service (FIAS) have shown that low tax rates alone do not attract FDI, the study actually found that government officials rated tax incentives highly, but executives at MNCs did not. Indeed recent figures support the claim that the presence of a low corporate tax rate does not imply a fixed presence of multinationals. Figures for 2002 show employment figures for IDA-supported companies are down 2.3% at 133,246. This figure languishes below the all time high figure of 140,896 achieved during the technology boom in 2000 (FIAS, 2003).

Over the past number of years Ireland's membership of the EU has become more tumultuous. This culminated in the 'no' vote against the Nice Treaty in 2002, a treaty backed by the government but rejected by the country under referendum. Add to this the fact that Irish economic cycles rarely seem to be in sync with any major EU country. Most notable here is the problem of inflation. In 2000, Ireland experienced a rate of inflation of 5.6%, while figures for France and Germany were much lower at 1 and 2%. Expansionary monetary policy which was pursued that year by the European Central Bank (ECB) only benefited the core countries and proved to be to the detriment of the Irish economy.

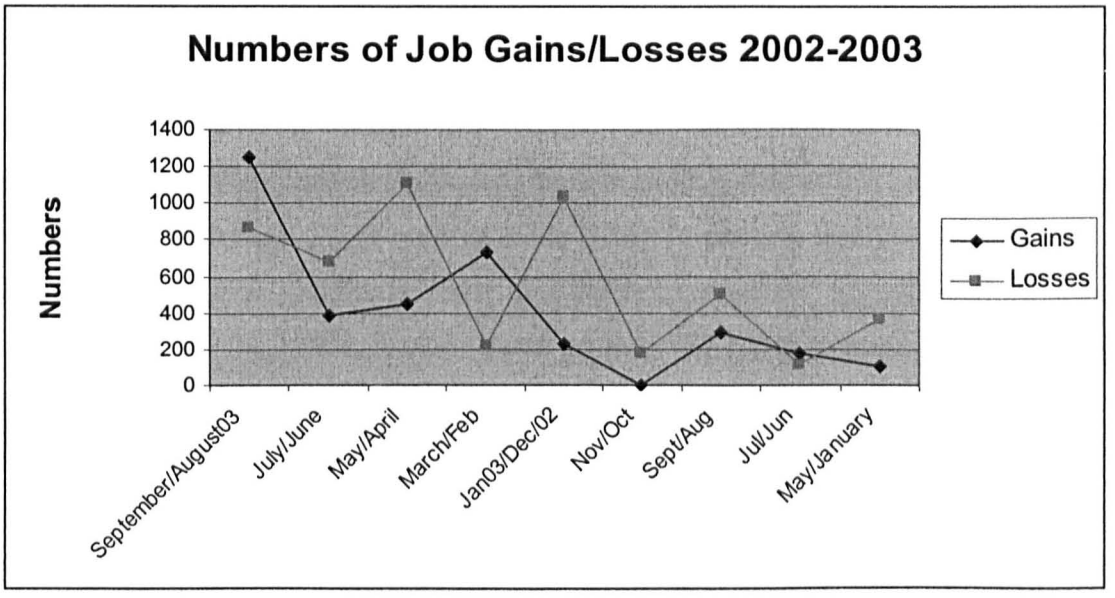
On the Fiscal policy side, the Finance Minister, Charlie McCreevy was given a rather public 'rap on the knuckles' by the ECB in February 2002, for overspending on his

budget. Add to this the fact that Ireland's status as a veritable tax haven is constantly the source of agitation in the EU, not to mention that by 2007 it is predicted that Ireland will be the fifth largest contributor to the EU in terms of size paying over €1 billion a year. This will make a big difference from receiving a net €1.5 billion a year, since 1986 which will, without doubt, put some strains on Ireland's relationship with Europe.

Although perhaps too soon to judge; Ireland's jewels do seem to have lost some of their shine. Ireland was forced to come to terms rather quickly with its new found prosperity. Industrial disputes and a degree of complacency within the European Union were to some extent an inevitable outcome of rapid rise in Irish economic fortunes over the 1990s. In the last couple of years Ireland's rather 'tigerish' growth has reached something of a plateau which might have been predicted because of the development path that the open economy of Ireland chose.

Ireland's economic fortunes have been decided, to a large extent, exogenously. The small economy of Ireland was opened up to such an extent that its development path was intrinsically linked with that of the world's major economic players, not least the US. The recent global economic downturn has had a direct impact on the open economy of Ireland, not least on its rather vulnerable high-tech sector. Figure 5.7 displays the number of job gains and losses it suffered in 2002/2003.

Figure 5.7 High-tech jog gains and losses



(Source: Electricnews.net, 2003)

The most common reason for redundancies cited by foreign companies was the relocation of jobs to Central Europe and Southeast Asia. Prior to March 2003 the blame was put on the global economic downturn for the closing of their factories. The two months of May and April 2003 saw the highest number of casualties numbering 1,105 in all. In total, the gap between the numbers of jobs created and the number lost is significant. It does not paint a healthy picture of the Irish high-tech sector especially when it is taken into account that indigenous firms laid off nearly ten times more workers than they have taken on over 2002/2003. Liquidations of Irish high-tech companies are on the increase, and at a much greater rate than any other sector, averaging about 20 liquidations a year since 2001 (Electricnews.net, 2002). Add to this the fact that foreign MNCs are citing competitiveness as their reasons for closing Irish branch plants and moving to lower cost companies and we begin to see some major flaws in the sector that will be the focus of the next chapter.

Conclusion

There can be little doubt that the turnaround in Irish economic fortunes has been nothing short of a miracle. Ireland has made a niche for itself and has successfully exploited the high-tech sector over the past ten years. What we need to know now is

whether Ireland has started an upward trajectory or whether the economic success was a bubble that has burst?

While the success of the 'Golden Era' has been duly noted in terms of increased GDP and increases in the numbers employed, there is another side to this story that has not got as much coverage. Facts such as those living in poverty and increasing gaps in income distribution highlight the inequitable economic growth that Ireland experienced over the 1990s. A study based on the 1987 ESRI household survey found that the bottom 50% of households have only 12% of total reported wealth, the bottom 70% have 28.5% of wealth leaving the top 30% with 71.5% of the nation's wealth (Nolan 1991, 14) and all evidence shows that this disparity has been increasing. In geographic terms, as the following two chapters will demonstrate, the 'tigerish' growth has been far from uniform. Indeed, excluding the wealth generated by the cities of Cork and Dublin, very few places showed significant positive growth.

What has been made clear in this chapter was the development path chosen by Ireland in the 1980s and 1990s. Following economic liberalisation in the 1960s and 1970s, Ireland opened itself up even more and has become highly dependent on the multinational sector it had worked so hard to build up. By the 1990s Ireland's targeting of MNCs in the IT sector had begun to pay dividends. It was Ireland's degree of openness that had made the country an attractive location for software development, owing especially to the global/footloose nature of this industry. This openness has been recognised and has seen Ireland rise to the top of a recently published globalisation index. According to the fourth annual A.T. Kearney/Foreign Policy Magazine Globalisation Index, the Republic was the most global nation in the world for the years 1999 to 2002 (http://www.foreignpolicy.com/story/cms.php?story_id=2493).

Ireland's high-ranking was mostly due to the country's "strong economic links and high levels of personal contact with the rest of the world" (ibid.). Ireland's relative economic strength also helped propel it to the top spot, scoring exceptionally high in areas like FDI, investment income, portfolio capital flows and international trade. Ireland also scored well in terms of personal connectivity which covers areas like tourism, international telephone traffic, and remittances and personal transfers. The

country did not fair so well in the area of technological connectivity. Indeed, with a rank of 24th for Internet users per capita and with only 27 percent Internet penetration, Ireland was ranked behind less wealthier nations like Slovenia and Malaysia. This is a somewhat worrying trend owing to the nature of Ireland's new found wealth and will be discussed in greater detail in chapter eight.

Looking at the growth path chosen by Ireland since the 1960s in tandem with the theory outlined in chapter two we can see a direct link between the industrial policies pursued in Ireland and the theoretical evolution from neo-liberalism to flexible specialisation and industrial districts over the same period of time. Beginning with the Whitaker Report in 1958, Ireland has pursued policies of openness to aid the free flow of the market to this day. State interference was kept to the minimum with the exception of the work of the IDA, which sought to make Ireland even more attractive with its incentive packages which most often included subsidised rent in industrial estates already set up in all corners of the country. In terms of theory the approach taken by Ireland over the past forty years can be considered as one very much influenced by the top-down supply/market-led school of thinking.

While there is no doubting the positive effects of Ireland's recent growth, it is also worth noting that there are some worrying trends to Ireland's growth path. Debates have raged in Ireland over the past number of decades regarding the sustainability of development heavily reliant on a foreign-owned multinational sector. Economists like Murphy (1994) have argued about the soufflé effect of capital repatriation by MNCs on Ireland's macroeconomic statistics. Others, such as Allen (2000), have criticised the top-down supply-led nature of Irish industrial policy in its attempts to attract these MNCs. We have seen some of the effects of the approach taken by the Irish government, an approach that nearly directly opposes the developmental approach embodied in the RISI ethos; that of bottom-up demand-led development. The following two chapters will look at the issues of the sustainability and coverage of Ireland's growth over the 1990s separately, firstly, I will take an in-depth look at what can be considered Ireland's leading industry; Software. Secondly, I will look at the regional impacts of this growth across Ireland.

CHAPTER 6: IRELAND'S SOFTWARE INDUSTRY

Introduction

Ireland's Celtic Tiger of the 1990s was the pinnacle of a development trajectory fraught with difficulties. After independence in 1922, the country strived for economic self sufficiency which took many decades of protectionist policies to attain (see Chapter 5). Until the 1960s, manufacturing industry was inadequate, most of which had been inherited from the British, or was owned by the State. A shift in government thinking in the 1960s and 70s informed the government initiatives which many claim laid the basis for the economic boom of the 1990s (Sweeney, 2000; Barry, 1999; NSD, 2001)

In the late 1970s, the Irish government made a decision to concentrate on attracting industry of a high value-added nature, preferably employing a high proportion of university graduates. In 1981, through its agency, the Industrial Development Authority (IDA), it launched its international services programme, indicating a shift away from manufacturing industry. This involved adjusting its financial incentives away from supporting investment in fixed assets and towards supporting investment in highly skilled staff.

This programme was particularly successful in attracting American software companies which began to use Ireland as a base for localising their products for the European and other markets. Early 'invaders' included Lotus, Digital Equipment (now Compaq) and Microsoft. Ireland rapidly became the automatic choice for software companies for the localisation of products, subsequently attracting Oracle, Novell, Informix and SAP among others. Foreign companies also came to develop new software, including Sun Microsystems, EDS and Motorola. Other companies who had previously had hardware manufacturing bases here turned to software during the 1990s. These included Ericsson, Amhahl (now DMR) and Nortel Networks (previously Northern Telecom).

> "Between our efforts to attract new industries and already existing industries – Ireland began to be looked at as a second home in Europe for their [US] operations. It gave a certain amount of comfort."
>
> Southwest Regional Director - IDA (Interview August, 2002)

In the 1980s, Ireland produced more technical graduates than it needed, and this surplus helped to attract foreign companies to locate here. In addition, some graduates emigrated, learned skills abroad, and returned after a period to take up key positions or get involved in indigenous start-ups (NSD, 2001). But Irish incentive packages for foreign investors have proved crucial in the creation of a 'booming' software industry in the country. Attractive propositions included subsidised land and labour for firms seeking to set up in Ireland, such packages embody a supply-led approach to development in the State.

The Emergence of an Industry

While a few Irish companies have been around since the 1970s, it was the late 1980s before the term "industry" was applied to software in Ireland. A campaign by the industry's trade association (now known as the Irish Software Association (ISA)) led to government recognition of the industry in 1989 with the setting up of the National Software Directorate in 1991. Other benefits accruing to the industry out of this included a low (10%) rate of corporation profits tax, previously applicable only to manufacturing industry. The work of the National Software Directorate led, inter alia, to the creation of a state-sponsored venture capital fund in 1996, in recognition of industry demands. Characteristics of the indigenous industry until 1990 included a reliance on services (mainly bespoke software development), low profits and few exports. From then until the mid-1990s, a major switch took place from services to products, and from servicing the local market to exporting.

At the end of 2000, it is estimated that the Irish software industry consisted of more than 900 companies, up to 22% of them foreign, employing 30,000 people and exporting over €8.5bn worth of products and services. Irish companies account for €0.875bn of that. In the last five years up to 2001, employment in the industry has

grown at an average annual rate of 20%. The world-wide shortage of skilled personnel has probably prevented an even faster growth rate. (HotOrigin, 2001; NSD, 2001)

Some observers link the emergence of the indigenous industry with the presence, in Ireland, of the multinational software companies. However, this connection is very tenuous, and no direct link actually exists. The presence of the multinationals has been good for the Irish economy, and for the companies involved, but it has not been a factor in the emergence of the Irish sector. Few Irish companies have been started by ex-multinational employees, nor has there been any history of sub-contracting by multinationals (O'Riain, 1999). It has been almost like two separate industries developing side-by-side with little or no interaction. The only real link is in staff leaving one to join the other. Staff who worked in multinational companies were, at one stage, more likely to have experienced structured approaches to software development, and this would be an asset to a small Irish company.

This chapter seeks to explore the issues contributing to the various facets of the success of the Irish Software industry in the 1990s. In doing this I will take an in-depth look at both the indigenous and multinational segments of the industry. After this a comment will follow on the interconnectivity of both. Finally, I wish to take a look at one of the most striking aspects of industry which is its geographical spread and lack thereof, by concentrating on the presence of the industry in the eight regional authority areas of Ireland.

Two things in particular characterise the Software sector in Ireland over the 1990s: exceptional growth; and a highly uneven regional spread. As we shall see, the Irish software sector is highly concentrated in and around the Dublin city-region, with sparse presence in Ireland's less-favoured regions. The Irish case sits well with some of the theory highlighted in chapter 2, while directly contravening that of the more technologically deterministic writings. In terms of the overall aim of my work, this chapter provides some interesting evidence on the locational features of high-tech industries of the information age. Where many academics and politicians talk of information age industries as the panacea of regional ills, what we see happening in Ireland is these industries actually adding to regional woes by compounding already existing patterns of industrial location and thereby regional disparity.

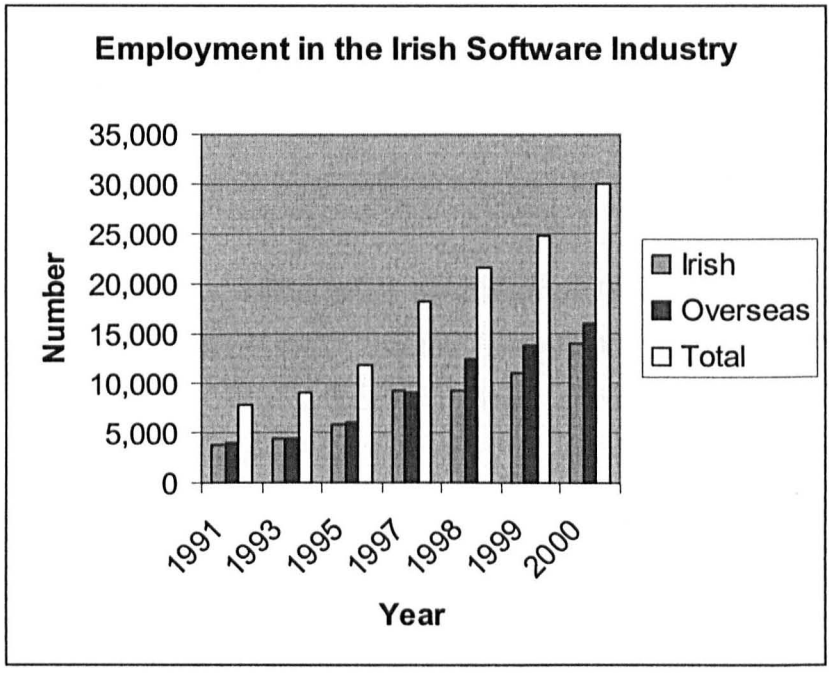
Ireland is not alone in experiencing the spatial bias of the software sector, the work of Peter Dicken pointed out the agglomerative tendencies of high-technology companies in Southern California as far back as 1993. In his work on the ICT sector in the UK, Ron Martin made use of location quotients to show the lack of geographic uniformity among regions, with the Southeast region accounting for over 50% of all ICT activity there (1998). More relative still, a forthcoming paper by Roper and Grimes (2004) compares the Software sectors in Israel and Finland to that of Ireland and note the overwhelming concentration/clustering in all three capital cities. They go on to place Tel-Aviv, Helsinki and Dublin as significant nodes in global production networks and note the lack of presence of software operations in the more remote regions of the respective countries. In the context of the chapters that follow this, a broader question influences the work: what kind of policy is necessary to maintain regional uniformity in the information age? By looking at the economic approach to the IS taken by the Irish government and comparing it to the more social approach of the RISI, we get some interesting insights into regional development in the Information Age.

Some Key Statistics of the Irish Software Industry

Employment, Revenues and Exports of the Software Industry

The Irish software sector grew from close to €3bn in 1993 to over €10bn in 2000. From 1993 to 1999 the indigenous sector grew faster than the multinationals increasing from about 13% of the total revenues in 1993 to close to 20% of the total in 1999 (HotOrigin, 2001). Employment in the Irish software industry increased at an annualised rate of around 15% during the 1990s. This growth performance is very impressive when compared with an overall 6% annualised growth in total employment in the widely acclaimed 'Celtic Tiger' economy during the 1990s (Arora et al, 2001, p.5).

Fig. 6.1 Employment in the Irish Software Industry



Source: Enterprise Ireland

Looking at table 6.1 in the context of figure 6.1 gives an initial understanding of the differences between indigenous and overseas firms in the software industry. As we can see there are nearly six indigenous firms for every overseas firm in the country. From figure 6.1 we can deduce that the average employment per company of the overseas sector is considerably higher than that of the indigenous sector.

Table 6.1. Foreign and Indigenous Software firms in Ireland

Type	Number of Companies (2000)
Indigenous	770
Foreign	130

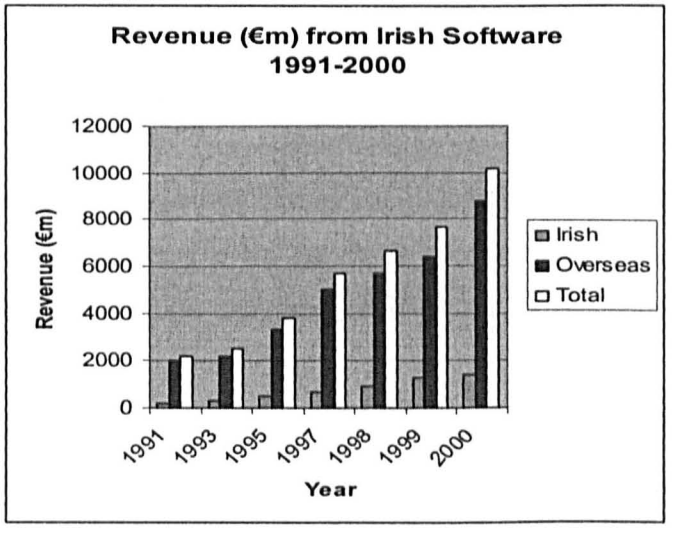
Source: NSD.ie

Figure 6.2 shows a near identical trend to that in Figure 6.1, however, in looking at revenue figures we can begin to appreciate the gap that exists between the indigenous and multinational segments in the Irish software industry. While both segments are virtually equal in terms of contribution to employment, the indigenous contribution to revenue is dwarfed by that of the multinationals. Certain State agencies (i.e.

Enterprise Ireland[1]) quote the brighter sides of these statistics, declaring Irish revenues to be up 700% while MNC revenues increased by 400% between 1991 and 2000. The reality of the situation is that while the increase in the indigenous side has been exceptional it has been from a lower base, indeed, over the said period indigenous revenues have still not reached the level attained by MNCs in 1991.

A point of note, which shall be addressed later in this chapter is the exaggerated nature of foreign MNC's profits in Ireland. This is a well noted problem (see Sweeney, 2000, Kirby, 2000, O'Hearn, 2002) which led to problems of national income accounting in Ireland. It is known that foreign MNCs engage in profit shifting, by doing this they exaggerate the profits earned in Ireland to take advantage of the beneficial tax regime there.

Figure 6.2. Revenue from Irish Software 1991 - 2000



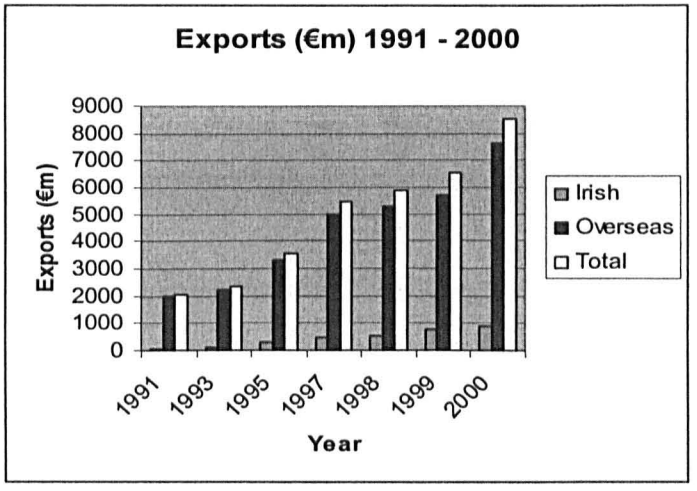
Source: Enterprise Ireland

Again the trend is mimicked in Figure 6.3 which depicts the growth in export revenues over the same period. The gulf between the two segments of the software industry in Ireland is even more pronounced here. While indigenous growth is

[1] Enterprise Ireland takes charge of indigenous development/investment, while the IDA does the same for overseas investment/development. The two were under the same umbrella (Forbairt) until their split in 1997 - hence different interpretation of the same statistics!

encouraging over the time period and its relative contribution to total software exports increases, in 2000 it was equivalent to only 11% of foreign MNC exports.

Figure 6.3. Software Exports 1991-2000



Source: Enterprise Ireland

Despite the improved performance of the indigenous segment, there are some clear differences with the overseas segment of the software industry (see below). According to Crone (2002) average revenue per company in overseas firms was up to 30 times that of indigenous firms. His calculation of productivity led to the conclusion that overseas firms were far more productive; average revenue per employee in 1999 being €523,000 compared to €115,000 in indigenous firms.

However, as Arora et al (2001) point out, productivity figures for overseas firms are as prone to misinterpretation as their revenue figures. Comparisons between the overseas and indigenous segments of the Irish software industry using these measures are somewhat spurious.

> "The leading overseas software firms probably choose to book revenues from their sales to the EU market in Ireland to take advantage of Ireland's 10% corporate tax rate. You can't use revenue per employee as a measure of productivity for overseas firms because their revenue itself is going to be over-stated"

Regional Director National Informatics Directorate (Interview December, 2002)

Industry Structure and Sub-sectors

The term software industry can apply to many different areas of work. For ease of interpretation and correlation I will employ the definition used by the National Software Directorate (used by most analysts of the Irish Software scene). This definition includes companies undertaking the following activities:

- Development of software products/systems for subsequent activities;
- Development of systems software or software development tools for sale vendors;
- Services directly related to the design and/or development of software systems;
- Localisation of either own organisation's products or third-party products;
- Development of programmes or systems for subsequent incorporation into hardware;
- Technical training in the area of systems analysis, design and programming;
- Provision of 'hot-site'/disaster recovery facilities.

The definition does not include:

- Personnel of Irish companies based at overseas offices;
- Data entry or data processing or bureau services for local or overseas organisations;
- Training services for standard packaged software;
- Software development by in-house IT departments;
- Sale of hardware or third party software packages.

Source: (www.nsd.ie)

Having a concrete definition serves well to further analyse what it is the firms incorporated under this definition actually do.

The Production/Innovation Chains Perspective

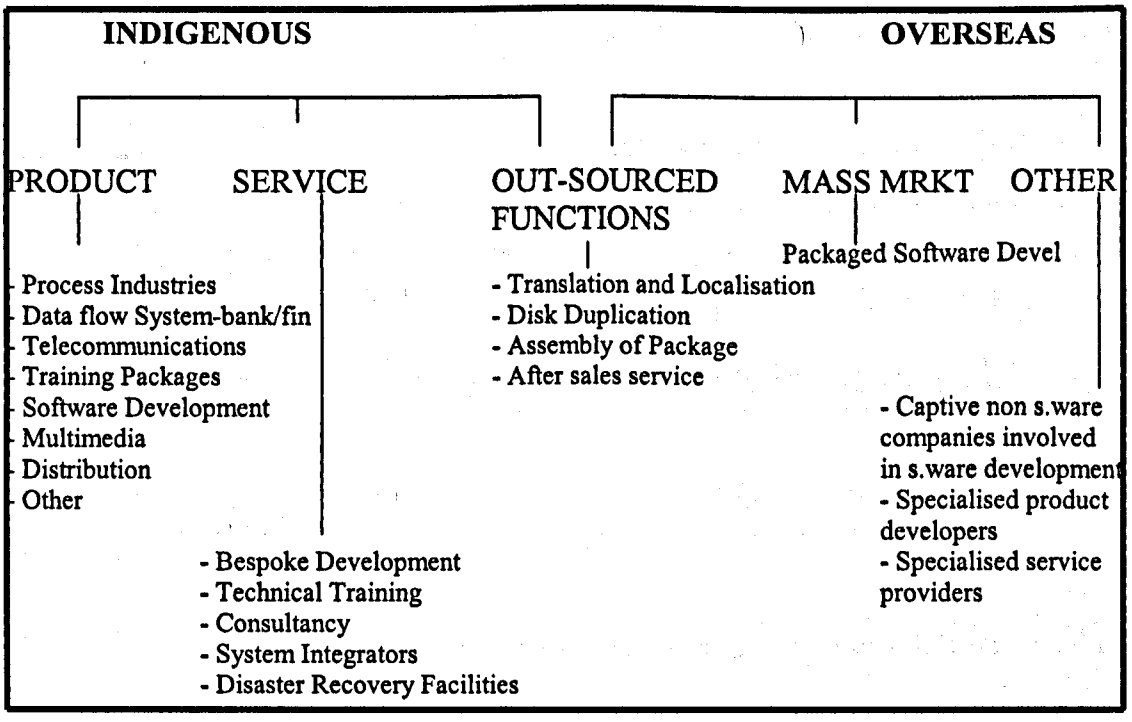
O'Riain (1998) found that multinational companies were "significantly more likely to be involved in the low-end activities of localisation, porting and assembly/packaging and logistics/distribution (and testing to a lesser extent)" (O'Riain, 1998, p.4). In contrast, Irish firms were found to be "significantly more likely to be involved in technical support and business solutions consulting" and also "marginally more likely to be involved in carrying out basic research, developing new products, and sales and marketing" (p.4). O'Riain (1998) goes on to identify two quite different and relatively autonomous global production/innovation chains which he sees as the two major sub-sectors of the Irish software industry. The first of O'Riain's software production/innovation chains - which has also been documented by Coe (1997) - is described as 'software logistics and localisation'. This sub-sector is the dominant production/innovation chain within the overseas sector and consists mainly of the subsidiaries of major US packaged software MNCs, which carry out software localisation, testing and distribution functions in Ireland. These 'low-end' activities are part of a wider international packaged software production/innovation chain, which sees 'higher' functions - including software development and marketing - conducted in the United States (Coe, 1997; O'Riain, 1997). The firms concerned are among the leading software companies in the world and they produce large volumes of (typically) standardised products for a mass market. A secondary element within this production/innovation chain is the "extensive vendor base of printers, translation bureaus and other suppliers" (O'Riain, 1997, p.12-13) which supports the Irish subsidiaries of the US packaged software MNCs.

The second of O'Riain's software production/innovation chains is described as 'software development'. This is the dominant production/innovation chain within the indigenous segment and consists primarily of small and medium sized Irish firms producing niche software products (often in small volumes) for export (O'Riain, 1998). According to O'Riain (1997), the leading companies in this sub-sector "are gaining growing recognition in international technical markets, are building partnerships with US firms and in some cases even going public in the US" (p.12-13). The typical presence of higher functions such as development and marketing at

these firms means this sub-sector has "a more rounded software development business model" (O'Riain, 1998, p.5) than the 'logistics and localisation' sub-sector. Hence, it is argued, the observed contrasts between the indigenous and overseas segments of the Irish software industry can be attributed to the dominance of (a) the 'software logistics and localisation' production/innovation chain within the overseas segment and (b) the 'software development' production/innovation chain within the indigenous segment.

Two other sub-sectors of the Irish software industry are identified in O'Malley and O'Gorman's (2001) diagram (Fig.6.4). These are not homogenous sub-sectors but aggregations of a number of other software-related activities. The first sub-group is composed of indigenous Irish firms who provide a variety of software services, including bespoke software development, software/IT consultancy and system integration. The second group is composed of overseas firms other than the packaged software MNCs and their supplier base. This includes both software and non-software MNCs (e.g. telecoms companies) with software development centres in Ireland, as well as other overseas firms who provide IT services to the local (Irish) market.

Figure 6.4. The Software Industry in Ireland



(Source: O'Malley and O'Gorman, 2001, p.309)

Indigenous Software Sector

The indigenous sector can be divided into companies involved in the production of software products or software services. According to O'Gorman et al. (1997), the former "develop a software programme which is then copied many times and sold to many customers" (pg. 8), while services are "uniquely provided to each customer as required" (pg. 9). Analysis I have carried out on NSD data suggests that around 44% of indigenous firms are involved in the development of software products. This figure is consistent with the findings of O'Riain (2000) who also presents evidence that 37% of indigenous firms are involved in providing services.

According to O'Gorman et al. (1997) individual product oriented companies in the indigenous industries tend to be "quite specialised in terms of the type of product they produce" in search of the niche market. It is the search for the niche market that has inspired some of Ireland's most successful indigenous firms such as Iona Technologies ltd. and Baltimore. HotOrign (2001) has identified 10 such successful product developers in Ireland competing on an international level, with a further 30-40 on the brink of breaking through to the international level.

Two different approaches to funding product development have been adopted by indigenous software firms. The first approach, which was perhaps more typical in the early years of the Irish industry's development, is to use services work to generate revenues which can then be used to fund product development. The second is to raise external funds. Typically this involves investment by venture capitalists in return for an equity share in the firm but it might also involve selling a minority share in the company to a larger established company (aka corporate venturing) or a key customer.

The rationale behind the focus of most indigenous firms is pretty clear.

> "We started in October 1994 and we started as a sub-contracts software products development company for other software companies. We proceeded with that for about 6 years. In Vistech in about 1998/9 we started looking at what products we wanted to develop and we started developing document management products

because we had expertise in this and imaging services. So we started developing our own products at that time."

CEO of Vistech - National Software Centre in Cork (Interview August, 2002)

"Sub-contracting has a lot of competition, the niches aren't as tight and it is a bit more difficult to tell people what you are doing."

MD of Sybernet - Dangan Innovation Centre in Galway (Interview July, 2002)

For the services side, customised development services are the most common type of service activity, being offered by more than half of all indigenous software firms. Other common service activities are Internet services (26% of firms) and multimedia services including outsourced video, voice and printed data services, desktop publishing and computer- based training (15% of firms). The other major service activity performed by indigenous software firms is localisation (14% of firms). Localisation covers a range of tasks including translation by language specialists, low-level programming, help-desk testing and designing, implementation of computer-aided translation (CAT) tools, and quality assurance. Localisation also includes lower value added activities such as packaging software programs on CD-ROM along with registration cards, labels, security devices and manuals (Arora et al, 2001 , p.10).

Foreign MNCs Software Sector

The foreign sector of the Irish software industry is even more multi-faceted, with the software logistics and localisation production/innovation chain being perhaps the dominant activity. We can split the foreign-owned sector in five categories:

1. Localisation, Manufacturing and Distribution of Software Packages (LMD)

Many of the largest overseas companies are US- owned packaged software MNCs whose products are typically sold in very large numbers to mass markets. The Irish operations of the majority of these firms are specialised in relatively low value added, sometimes low skilled, activities including porting of legacy products on new platforms, localisation (text translation, changing formats, etc), disk duplication,

assembly, packaging, and distribution/fulfilment (Coe, 1997; O'Riain, 1997). Other MNC subsidiries in this sector (e.g. Oracle, Corel and Novell) outsource many of these tasks - whilst retaining responsibility for them - and concentrate on managing relations with sub-contractors, administration and other back-office functions such as multi-lingual customer support (Coe, 1997; Arora et al, 2001).

2. Software Supporting Subcontractors (SSS)

This sector is related to the first category, in that its very existence can be attributed to the fact that some of the subsidiaries of packaged software MNCs outsource or sub-contract certain functions within Ireland. This phenomenon has stimulated the development of a specialised vendor base of localisation/translation bureaus, printers, disk manufacture, and logistics specialists. Taken together, the LMD and SSS section make up the logistics and localisation production/innovation chain documented by O'Riain (1997, 1998).

3. Software Development Centres (SDC)

The other major sector of the overseas segment of the Irish software industry is composed of software development centres. These dedicated software development operations undertake work of varying degrees of sophistication but typically employ a much higher percentage of computer science graduates and software engineers than the LMD firms. Some SDCs are part of major computer services or IT consulting MNCs (e.g. EDS, IBM, ICL and Accenture) and are involved in specialised or customised software development for internal (group) or external clients. Several telecoms MNCs (e.g. Motorola, Ericsson) also operate SDCs that focus on the development of embedded software and software applications for ICT hardware devices (e.g. mobile phones) (O'Riain, 1998). In previous accounts of the Irish software industry, the significance of SDCs within the overseas segment has possibly been understated.

The motivation for establishing these software development centres in Ireland is alleged to be Ireland's particular combination of available skilled labour at relatively competitive international rates (Coe, 1997; Arora et al, 2001). In some instances, skilled labour seems to refer to a general availability of computer science/software engineering graduates, with a classic example being EDS. In other instances, skilled

labour seems to mean more specific areas of expertise. For example, Coe (1997) asserts that Ireland has gained recognition as an important UNIX development centre within Europe, with companies such as Motorola and ICL having established UNIX Programming centres. Telecommunications software (including mobile phone software) seems to be another area of expertise in Ireland, with companies such as Ericsson, AT&T, Alcatel, and Motorola having established SDCs. Overall, it is a different group of companies from those in the LMD sector that have established SDCs in Ireland. However, there have been some instances where firms that already had ICT hardware manufacturing operations in Ireland have followed these earlier investments by establishing specialist software operations at a later date (e.g. Digital - now Compaq, Ericsson).

4. International Software and Computer Services Firms Serving Local Markets

According to both Coe (1997) and O'Riain (1997) there are also a number of firms in the overseas segment who serve purely local (domestic) markets. O'Riain (1997) states that these are "predominantly the service arms of mainframe companies" (p.14) whilst Coe (1997) says these subsidiaries are usually small, with less than 100 employees (p.217). Domestic market-oriented software FDI is relatively insignificant in Ireland because of the small Irish IT market, which accounted for just 0.6% of the EU total in 1994.

5. Acquired Former Indigenous Companies

A fifth category within the overseas segment of the Irish software industry comprises former indigenous companies that have been acquired by foreign firms. NSD statistics indicate that foreign firms had acquired 12 indigenous firms, with over 2,000 employees and annual revenues of €200 million, by 1999. Some high profile examples include Kindle Banking Systems (acquired by Misys of UK), Logica (which acquired Aldiscon), Pore Systems (which acquired Euhstix) and CSK (which acquired Quay Financial Software) (Crone, 2002).

The nationality of firm varies by activity; US-owned firms are relatively over-represented in LMD and SSS whereas other nationalities account for a disproportionate share of firms undertaking software development.

Irish Indigenous Industry

In 1987, the fledgling indigenous Irish software industry was dominated by tiny firms providing services and consultancy to businesses that were beginning to adopt IT systems. Since 1996 in particular there has been a major upsurge in the number of indigenous software companies (HotOrigin, 2001, p.5). During this period, the indigenous sector has been growing turnover at between 30% and 40% per annum (HotOrigin, 2001, p.5), much faster than the overseas sector. Employment growth in the indigenous sector has also outstripping that in the overseas sector. Average revenues per company and average revenue per employee have also increased steadily and significantly since the early 1990s (O'Malley and O'Gorman, 2001)

The number of indigenous software companies has grown rapidly, by 11.6% per year in 1991-1997. Since indigenous employment grew even faster, firms have grown on average in terms of their employment size. However, average employment per company was still fairly small at 16 in 1997 (NSD data, 2001).

In the second half of the 1980s, the world market for software and computing services was growing at an average rate of 28% per year. However, this slowed appreciably to about 10-15% per year in the early 1990s (Clarke, 1995). In the EU market, demand for software products was growing by 11.1% per year in 1991-1994, valued in terms of current Irish pounds. At the same time, demand in the EU market for the broader category software and computing services grew by 8.8% per year, also valued in current Irish pounds (derived from Commission of the European Communities, 1994, Table 1). By comparison, in 1991-1995 (much the same period), sales and exports of the Irish indigenous software industry were growing at much higher rates.

Since the growth of the Irish indigenous software industry has been exceeding growth in international demand in the 1990s, it can be regarded as internationally competitive. This section will probe deeper into the nature of the Irish software industry looking at its structure and size, origins of the companies, R&D activity as well as collaborations within the industry.

Size analysis of the indigenous industry

The Irish indigenous software industry comprised almost 700 firms with over 11,000 employees by 1999. Although the mean employment size of 16 suggests indigenous companies tend to be small, there is actually considerable variation in company size. In 1998, 82% of all indigenous firms had less than 25 employees, and 61% had 1-10 employees. However, these smaller firms (i.e. 1-24 employees) accounted for only 35% of indigenous employment. At the opposite end of the size spectrum were 34 large indigenous firms, with more than 50 employees, which accounted for 43% of all indigenous employment in 1998. Among this latter group were 10 firms with more than 100 employees that accounted for almost a quarter of indigenous employment (nsd.ie date, 2002).

The number of firms with more than 50 employees increased from only 4 in 1989 (NSD, 1992) to 14 in 1992, 24 in 1995 (O'Gorman et al, 1997) and 34 by 1998. On the basis of a company database available from the NSD, there may have been in excess of 60 indigenous firms with more than 50 employees by 2001. This is evidence of a developing critical mass of sizeable indigenous software companies.

Arora et al (2001) argue that "the growth of the software industry in Ireland during the 1990s was largely due to the entry of new firms rather than firm growth" (p.6). However, the evidence shows that 20 additional indigenous companies joined the 50+ employees size band in just six years between 1992 and 1998. Also the number of firms with more than 100 employees increased from 6 to 10 in only three years (1995-98). Secondly, consider the fact that the mean employment size among firms with more than 50 employees increased from 89.9 in 1992 to 117.2 in 1998. Thirdly, note that the share of indigenous employment in large companies (more than 50 employees) increased from 33% in 1992 to 43% in 1998. So, in fact, the largest firms added a disproportionately large number of new jobs in this period (Crone, 2002).

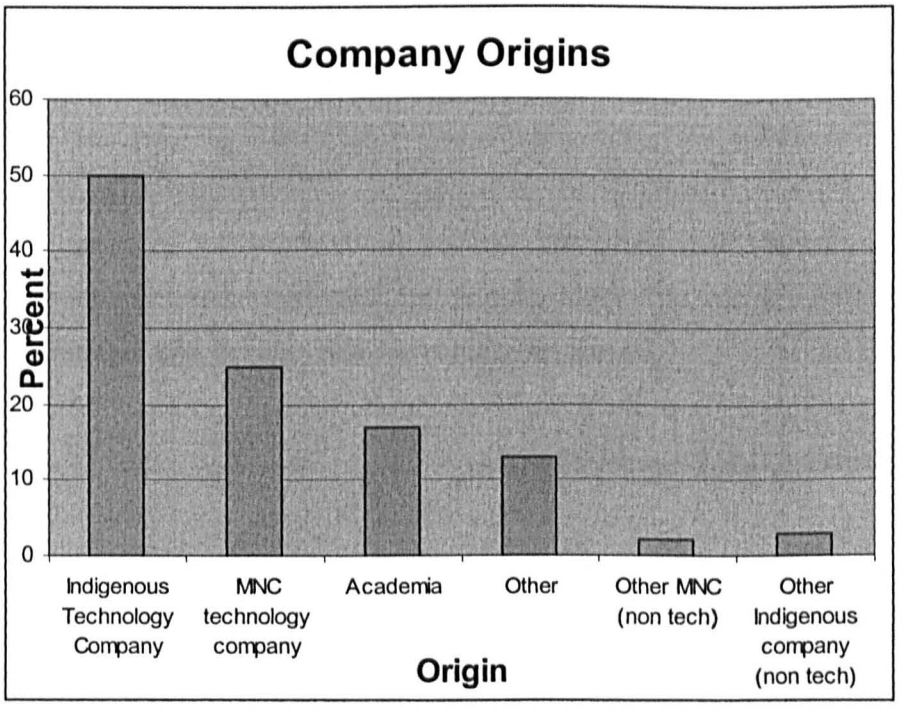
The NSD size analysis of the indigenous software industry in 1998 also includes a breakdown of revenue. An interesting observation about these data is that the 34 firms

with more than 50 employees earned 56% of all indigenous software industry revenues (compared to 43% of employment). Further the 10 firms with more than 100 employees earned 36% of all indigenous software revenues (23% of employment). In contrast firms with 1-24 employees (82% of indigenous firms and 33% of employment) earned just 25% of indigenous software revenues. This confirms the dominant position of a relatively small number of leading firms within the indigenous software industry.

Where do Software firms come from?

Half of the indigenous software companies in Ireland were founded by ex-employees of indigenous technology companies. Founders previously employed by technology multinationals follow at a quarter of the total. The third significant origin is academia at 17%. The future of the software sector is dependent on a lively indigenous technology company population to keep the birth rate up.

Figure 6.5. Indigenous Company Origins



Source: HotOrigin (2001)

Contrary to popular opinion on the importance of multinational management experience; the most successful companies (based on average revenues) are those with indigenous roots not multinational roots. However, the importance of the presence of MNCs cannot be underestimated. One interesting point is the cluster of software industries based in Galway city. In 1993 Digital shut down its operations in the Ballybrit Industrial Estate with the loss of 800 jobs directly and many others indirectly. The small city was shaken before the term Celtic Tiger was ever heard of. What happened as a result of the closure makes the city an interesting case to study.

> "We all thought this closure [Digital] was the greatest disaster since the Flood but with hindsight it was probably the best thing ever happened to Galway at the time as our people and leaders had to work together to attract new industry to our City and County - a task which has not abated since and which has been most successful to date. On top of that we have seen the development of many small to medium sized successful indigenous industries, set up by former Digital employees."
> (Galway Gazette, January 2000)

Indeed two of the three CEOs of indigenous high-technology companies interviewed in the city claimed to have spun out from the closure of the multinational:

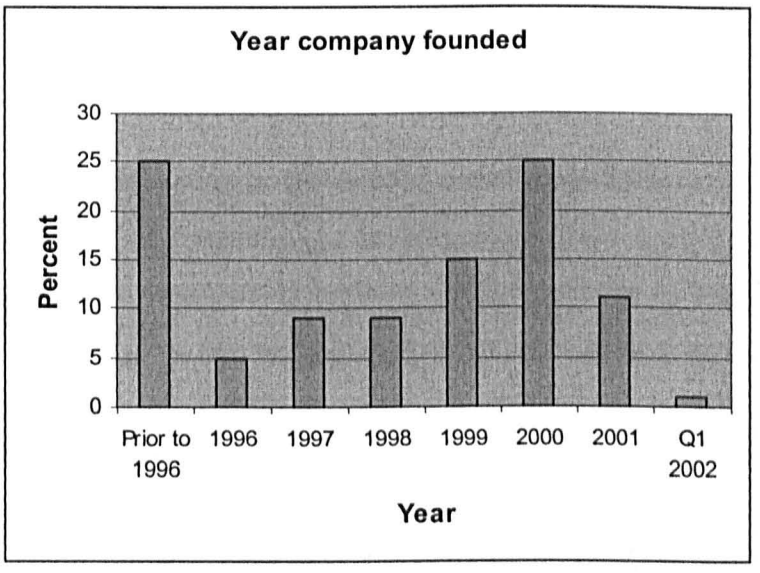
> "Basically we came about through the closure of Digital – I am one of the founding partners, myself and another chap who worked with me in Digital got together and decided that we could go it alone."
>
> MD of Sybernet Ltd.(Interview July, 2002)

Parthus (originally called SSL) was established in 1993 also as a direct result of the closure of Digital and has now been bought out by another US multinational.

How long have they been around?

The number of new company formations has come back to earth from the dizzy heights in 2000. To illustrate this, HotOrigin survey data shows a sober 11% of companies were founded in 2001 versus 25% in 2000. Enterprise Ireland identified 30 new high-potential start-ups in software in 2001 versus 43 in 2000 confirming this trend. The recent fall-off in start-up numbers is no surprise considering the blow that was dealt to the software industry worldwide by the tech-share crash toward the end of 2000. It is of the utmost importance that Ireland remains a start -up friendly country. In order to do this it will have to change its approach to venture capital funding and redress its attitude towards research and development.

Figure 6.6. Year Company was founded



Source: HotOrigin (2002)[2]

Software companies tend to flourish in vibrant clusters (Castells, 2000). Ireland has a young software cluster with more than half of all indigenous companies founded in the last three years. It is unlikely to develop a globally significant software cluster without a significant commitment to R&D activity through both public (mostly third

[2] HotOrigin is one of Ireland's leading early stage investment and specialist consultancy companies. It is a venture capital company that focuses on software companies, particularly those with deep intellectual property and enabling technologies. It is based in Dublin and has carried out a series of evaluations of the Irish software scene.

level) research and encouragement of business R&D through multinational corporations and indigenous software firms. Despite the publicity surrounding investment in R&D, Ireland is behind the competition in this area and this will affect the long- term competitive position of the software cluster.

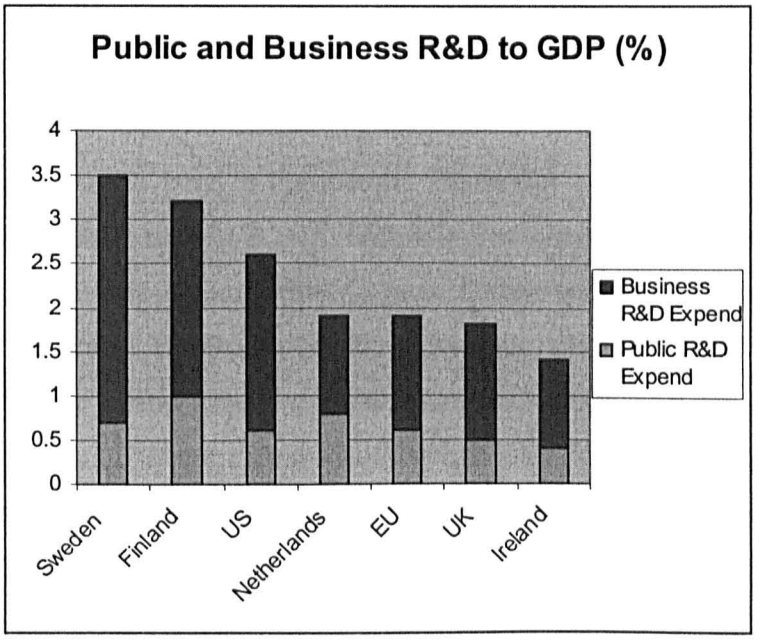
Research and Development

Research and development plays a major role in driving growth in an economy. Countries that want to compete in the global knowledge economy have recognised the importance and need for research and development and are actively encouraging it. There is a very strong positive correlation between investment in R&D and economic performance. In response to this, most developed countries are actively encouraging R&D and tracking innovation statistics. Countries that do not spend much on R&D do not file many patents and have a low rate of introducing technologically improved products.

Commercialisation or technology transfer can be broadly defined as the methods and processes of transferring research results from a third level institution or research centre to a commercial application. The methods of transfer normally involve either licensing of a patent or the creation of a new company to exploit the research. Spending on R&D is only the beginning of the story. Without effective commercialisation of new technology, economic benefits will not be harvested.

Ireland's public research and development expenditure as a percentage of GDP lags far behind the EU average of 0.66% at 0.29%. Sweden, Finland and the Netherlands are leaders in the EU. While business R&D is in a better position it is still well behind the leaders, Sweden, Finland and the US as illustrated in figure 6.7.

Figure 6.7: Public and Business R&D



Source: EU Innovation Scoreboard (2002)

The Irish government allocated €295.7m to R&D in 2003. This represents an increase of 58% over the actual expenditure in 1999 of €187.5m. With this level of spending, Ireland's public R&D expenditure as a proportion of GDP has increased from 0.21% of GDP in 1999 to 0.29% of GDP in 2000 but still remains behind the competition. Given that R&D is key to developing a knowledge economy, Ireland's position at the bottom end of the EU pack and well behind competitors like the Netherlands, Sweden and Finland, is of significant concern.

"To date, Government Departments and their agencies have under-invested in the commercialisation of non-commissioned research even relative to the historically low level of publicly funded research and development (R&D) carried out."

ICSTI February 2001

The ICSTI report on commercialisation paints a dark picture of the state of R&D and commercialisation in Ireland. It maintains that too few companies participate adequately in R&D, and recommends that continued (matched) grant assistance should be focussed on R&D by start-up companies and by those seeking to implement

a significant shift in company development, based on R&D and innovation. It also highlighted the significance of third-level research in carrying out R&D.

Software spinouts from third-level research

There have been a number of successful campus companies in recent years with companies such as IONA Technologies emerging from Trinity College Dublin, WBT Systems from University College Dublin and Scientific Systems from Dublin City University. HotOrigin (2001) shows that 17% of the indigenous software companies on the island consider themselves to be spun-out of academia. Importantly, the percentage is increasing - the average over the past five years is closer to one in four - suggesting that academic origins are likely to be a major source of new start-ups in the future. More than 50% of the companies in this group were founded in the three years prior to 2002.

Table 6.2 Year of spin-out

Year	Percent
Prior to 1996 (incl.)	9
1997	29
1998	35
1999	15
2000	16
2001	20

Source: HotOrigin (2001)

The development of incubation centres supporting new businesses on-campus such as the Invent Centre at Dublin City University (DCU), the Enterprise Centre at TCD, the Nova Centre in UCD and the incubation centre at University of Ulster are assisting with this process. The Institutes of Technology have also started developing incubation centres on-site to help new companies often with the assistance of grant aid from Enterprise Ireland. Initiatives like the National Software Centre in Cork are also creating momentum in the regions.

Table 6.3. University/college from whence they came[3]

College	Percent of companies from Universities/Colleges
Trinity College Dublin	30
University College Dublin	17
Queens University Belfast	14
Dublin City University	14
Dublin Business School	4
EPFL Switzerland	3
University of Ulster	3
National University of Ireland, Galway	3
Limerick Institute of Technology	3
University of Limerick	3
National University of Ireland, Cork	3
Dublin Institute of Advanced Studies	3

Source: HeaNet (2002)

Technology transfer from Universities to indigenous companies

The transfer of third level research to indigenous software companies can be achieved through either indigenous companies funding research within the university through joint research with the university or through licensing of the university research that has already been completed. A third of indigenous software companies say that they have funded research or are working with third level institutions on joint research projects. Of this total, 81% rate this collaboration as effective or very effective. UCD is a leader in this activity (HotOrigin, 2001).

[3] *University Spinout Terms*
An Official University/ College spinout - where the transfer of college-researched intellectual property (IP) is the foundation of the new company (generally the Intellectual Property is accompanied by the academics) and the college takes an equity stake in that company (and/ or royalties/ license fees on the technology)
- An unofficial University/ College spinout - where untraceable college-researched intellectual property is the foundation of the new company
- Licensing of technology - where the transfer of college-researched intellectual property is made to a company in return for royalties/ license fees on the technology (only possible with a patented technology)
- University/ College start-up - a new company created by college academics or post-graduates
- Campus Company - where a company is located on campus in an incubation centre (there may be no further relationship than this)

Table 6.4. Research with whom?

College	Percent of companies that work with Universities
University College Dublin	15
Irish Institute of Technology	11
Imperial Research Institution	10
University of Ulster	10
Trinity College Dublin	10
Dublin Institute of Technology	8
University of Limerick	7
Queens University Belfast	7
National University of Ireland, Cork	7
Dublin City University	7
Other Irish	5
National Microelectronics Research Centre (NMRC)	3
National University of Ireland, Galway	2

Source: HotOrigin

> "There is often a perception from academics that commercialisation is the easy part but once they're involved they realise it's challenging.. .it took us a year to change the mindsets of the people involved from 'these commercial guys are trying to steal my idea' to 'I really trust these guys and I want to work with them'"
>
> CEO, BlueChip Technologies (Interview August, 2002)

On average 13% of companies in the EU collaborate with universities and research institutions (Eurostat 2000). In the Republic of Ireland this figure is much lower at 9%, however, representatives of State development bodies go to lengths to emphasise their efforts to change the prevailing views on collaboration in Ireland.

> "We are looking at enhancing economic development capacity in all the Irish regions, we recognise the importance of high-tech industries in helping to attain this, so we are now heavily involved in working with third level institutes in order to bring about a closer relationship with industry"
>
> Regional Director, Enterprise Ireland (Interview December, 2002)

Patent activity

38% of software companies in Ireland have applied for patents and one in five companies hold patents. When we look at the split between companies, ex-academia and the rest, the affinity for patenting by academics is clear. 39% of companies with academic origins hold patents compared to 17% of the non-academic companies:

Table 6.5. Academic v non-academic company patents

Company	Percentage of Companies with Patents Held	Percentage of Companies with Patent Applications
Non-academic	17	36
Academic	39	48

Source: HotOrigin (2001)

While it appears that some progress has been made in numbers of spinouts, the official picture is not so bright. Stronger support for commercialisation is required to ensure that more companies are started and that more research finds its way to commercial application. Key issues need to be addressed to achieve the development of a policy framework particularly for intellectual property ownership, resources for commercialisation activities and the development of linkages with industry and collaboration between institutions and departments.

The Overseas Software Industry: Foreign Direct Investment in Ireland

An extraordinary boom began in the US in the 1990s. The Dow Jones Industrial Average rose from 3,000 points in 1991 to more than 10,000in 1999. Other indicators such as employment, GDP growth, export growth show a similar rate of expansion over the same period. The expansion of IT production and the ever-increasing search for new markets caused a revival of foreign direct investment by US MNCs. US investment brimmed over the top and searched for new places to produce and sell. England was attractive – Portugal and Spain less so, Ireland was somewhere between the two. Over two decades, large numbers of educated technicians with skills were

required by firms producing the new technologies. Also the IDA has been said to be one of the best industrial attraction agencies in the world, renowned at identifying potential investors and supporting them when they were there (Commission, 2000). It was also helped by government regulations making Ireland one of the most pro-business locations in the EU.

Moreover, the 'business environment' in Ireland was rapidly improving with the reintroduction of a corporatist industrial relations system, most notably the social partnership. Strikes per year fell from 200 in 1984 to 50 in 1989 (Allen, 2000). Trade Unions traded wage restraints and flexibility for other benefits for workers, such as tax cuts. The social partners negotiated a series of national agreements whose main aim was to ensure wage restraint and agreement around fiscal restraint. Social partnership has been credited with enabling the Irish regime to maintain a macro-economic environment that was favourable to growth (IMF 2000). In addition to pay restraint, the state corrected its severe debt problem with an austerity policy during 1987-89 and fiscal restraint thereafter (see Chapter 5). The 'favourable macro-economic environment' also included moves toward deregulation and privatisation. Inflation, exchange rates and interest rates were removed from political and industrial relations arenas in the run-up to EMU. All this created an environment that was even more pro-business than in the 1970s and 1980s.

The most attractive aspect of Ireland to the MNCs, however, was its tax regime, where other EU regions taxed corporate profits at rates of 30 – 40 percent, Ireland's rate was a mere 10 percent. This was enforced on the state by the EU, because the earlier regime charged zero rates for mainly foreign exporters and higher rates for (mainly indigenous) producers for local market, which the EU considered illegal (O'Hearn, 2002).

Green et al. (2001, p.7) report that Ireland, with just 1% of the EU population gained 23% of all FDI projects (covering manufacturing, software, teleservices and shared services projects) in 1997. But Ireland has been even more successful when it comes to securing FDI in software, being the undisputed premier location for software FDI in Europe. "Ireland has the largest market share of FDI in Europe with 55% of the

total, more than twice the market share of the next most successful country (France at 21%)" (p.7).

The Information Technology sector expanded from a base of just 45 firms employing around 1,500 staff in 1987 (Coe, 1997, p.216) to 108 firms employing around 9,100 in 1997 and an estimated 120 firms employing 11,700 in 1999 (Figure 6.1). Plus, there was a net increase of 75 firms and over 10,000 jobs in just 12 years.

Example of IDA and Industrial Investment

In 1990 at a historically high cost to the IDA and the Irish State, Intel chose a location in Lexlip (Co. Dublin) as its European site for the production of computer chips. Intel moved into Ireland in two stages – in 1991 and 1995 – investing €1.27 billion in the first stage, of which €89 million was paid directly by grants from the Irish government. Moreover, Intel financed its investments through tax loopholes that cost the state an additional €178 million by the end of 1996. A similar package was negotiated for Intel's second stage of expansion. The cost per job was huge: in terms of direct grants, more than €38,000 compared to an average of €15,000 per job in other IDA sponsored projects during the 1990s (close to the average annual wage of the jobs it attracted). Once tax loopholes are considered, the cost to the state was possibly double the amount of grants.

An explanation of this high level of assistance can be seen through the relocation over the next couple of years of nearly every major player in the computer industry into Ireland: Gateway, Dell, AST, Apple, HP and Siemens-Nixdorff in PCs; Intel, Fujistsu, Xilinx and Analog Devices in integrated circuits; Seagate and Quantum in disk drives; Microsoft, Lotus and Oracle in software. Moreover the country became the major centre for telesales and teleservicing for Dell, Gateway, IBM, Digital and many others. Along with these leading firms came hundreds of less well known companies in all areas around computing, power supplies, cables, connectors, data storage, printers and networking. Between 1991 and 1994 Ireland's share of foreign investment into the EU tripled – the IDA claimed that Ireland was the destination for 40% of US electronics investment into Europe.

Analysis of the Top 60 overseas MNCs in the software sector shows that US firms are the dominant sub-group, accounting for around 62% of employment and 31 software firms. UK- owned firms are the next most important group, accounting for 9% of employment in the Top 60. Among the other nationalities French, German, Japanese, Dutch and Canadian firms each account for between 3% and 6% of employment in the Top 60 overseas firms.

Table 6.6. MNCs, by Nationality

Nationality of Ownership	Number	Percent
US	71	48.3
UK	18	12.2
Germany	16	10.9
Netherlands	9	6.1
Canada	8	5.4
Japan	6	4.1
France	5	3.4
Norway/Sweden/Finland	7	4.8
Other(Switzerland/Belgium/Israel/Australia)	7	4.8
Total	147	100

Source: Crone (2002)

Another notable and persistent feature of the overseas segment of the Irish software industry, which was not apparent from the data in Figure 6.1, is the dominance of a relatively small number of leading firms. In 1992, the top four overseas companies accounted for 45 per cent of employment in the segment and the top 20 accounted for 76 per cent. Despite the overall expansion of the overseas segment, the dominance of leading firms persists today. As an indication of the current concentration of the overseas segment, note that the top four firms from the Top 60 overseas firms list accounted for 27% of employment and the Top 20 firms for 71% (well over 11,000 employees) Notably, the Top 20 firms accounted for 2.5 times as many jobs as firms ranked 21-60. Conspicuously, many of the leading overseas software companies are well-known American names and many are located in and around Dublin. Thus, 13 of the Top 20 firms are US-owned (including the likes of Microsoft, Oracle, IBM Lotus, Symantec, EDS and Sun Microsystems) and 16 of the Top 20 are located in Greater Dublin (HotOrigin, 2002: pp.38-40).

Ireland's Software Industry: The Overseas and Indigenous Mix

The emergence of an infrastructure of software supporting sub-contractors within Ireland can be seen as a positive development in a number of respects. First, and most obviously, sub-contractors provide considerable employment (estimated to be over 4,000 jobs) and this will have associated multiplier effects on the Irish economy. The quality of employment in the sector has undoubtedly improved over time as 'higher-quality' service functions such as translation and localisation have been established. Second, the firms that have emerged in Ireland as a result of outsourcing have, where successful, made significant profits from the business (O'Riain, 1997). Third, the development of a competitive SSS sector has been a learning process that has brought international standards of best practice in sub-contract manufacturing, supply chain management and distribution/fulfilment to the Irish economy. Fourth, Ireland's SSS infrastructure has become an important location factor that has helped to attract further rounds of software FDI into the country. Fifth, the strong linkages between packaged software MNCs based in Ireland and the local SSS infrastructure have the effect of 'embedding' these Investments in the Irish economy.

Taking a more critical viewpoint we can point to a number of less positive effects of the SSS sector. First, it must be acknowledged that many of the products and services supplied by sub-contractors are fairly basic and do not constitute innovative high-technology industry (Coe, 1997). Second, and probably most important, it is widely acknowledged that the SSS sector as a whole is tied into dependent sub-contracting relationships with a relatively small number of powerful packaged software MNCs (Coe, 1997; O'Riain, 1997). These MNCs are in a strong position to dictate the terms of sub-contracting relationships. For example, one MNC manager told O'Riain (1997) one of the reasons they had located in Ireland was that an MNC partner 'had pre-bashed the suppliers for us'. Thereby sub-contractors are typically forced into a position where they must absorb most of the demands for flexibility in the industry (e.g. fluctuations in demand) and face constant pressures for cost reduction. Third, this dependence on business with the software MNCs means the SSS sector is vulnerable to technological change, such as any moves by MNCs to distributing software over the Internet (Coe, 1997; O'Riain, 1997). Another consequence of this

dependence is that sub-contractors are not in a position to influence the development of the industry or shape future markets (Coe, 1997; O'Riain, 1997). Fourth, and finally, it should be noted that the increasing penetration of foreign ownership within the SSS sector has led to a loss of local managerial control. Thus, overall the emergence of the SSS sector has be characterised as a case of 'dependent development' (Crone, 2002; O'Sullivan, 2000).

The rise of a dynamic indigenous sector, tied directly or indirectly to the explosion of activity by MNCs in the 'new economy', would be the most important indicator that Ireland had reached a switching point in the 1990s. O'Malley (1998) argues that the 1990s was indicative of that turning point because a dynamic indigenous manufacturing sector had grown alongside the multinational sector. Others say that what was different about the MNC expansion in the 1990s was that it was bigger than any seen before and more importantly it was more rooted in the economy through strong links with Irish suppliers. In Barry (1999) and Barry et al (1999) the contention is that MNC expenditure per employee rose 50% between 1983 and 1995, along with the fact that the 'shakeout' of the 1970s and 1980s left only dynamic Irish firms standing.

O'Riain (1999) talks of 'two globalisations' in Ireland in the 1990s. The first was the outward movement of US capital through Ireland into Europe. The second, was the development of an indigenous Irish sector that was dynamic and globally oriented. The Irish links with Silicon Valley was a great help plus the fact that they were no longer dependent sub-suppliers of MNC subsidiaries but were world-class exporters in their own right. O'Riain (1999) credits Irish flexible development policies (unlike the bureaucratic one of South Korea in the 1970s) – which did not control corporate decision either by direct political pressure or interest/exchange rates or prices as being of importance. The state combined a neo-liberal macro-economic environment, which attracted capital investments, with trilateral social partnership agreements, which enhanced flexibility. Fiscal restraint, low taxes and low wages were combined with targeted state programmes to foster key skills and provide infrastructure.

At the enterprise level state agencies were given a lot of praise – In response to criticisms about the lack of linkages between the foreign and the indigenous, Forbairt

set up a national linkages programme in 1985 to exploit the potential. Thus the Irish state identified opportunities across a range of small local firms rather than prodding large business groups into new market.

> "Our view has always been that we are trying to develop strong sectors rather than just trying to win individual projects. If you look at the structure of the IDA we have a unit dealing with ICT, software etc - so if you look at what their sub-supply needs are. Looking at the medical devices side - Boston Scientific etc and then you look at the whole range of supply-chain companies that came in on the back of them. And that is not just the multinationals, it's the locals, and the networking goes beyond that when we are looking at moving them up the supply-chain to higher level work with R&D - then we get more actors involved, especially from the educational sector. Collaboration is integral"
>
> Regional Director of the IDA (Interview December, 2002)

According to O'Hearn (2002) the glowing accounts of indigenous revival in the 1990s are distinctly overblown. Forbairt / Enterprise Ireland's linkage programme had only limited success. The fact is no real pressure was/would be put on MNCs. In 1996, out of 2,667 SMEs only 174 were sub-suppliers to MNCs, the sectoral distribution of which would hardly be described as hi-tech. 114 were in plastics, fabricated metals or paper/printing products, 33 in electrical engineering or computers and 2 in chemicals (Breathnach and Kelly 1999).

Most MNCs were buying their inputs from other MNC subsidiaries. Dell buys Intel computer processors and official figures called these local purchases. The same was true for a raft of MNCs located in the Dublin agglomeration after 1992. Forfas (1997) estimated two-thirds of local purchases were between MNC subsidiaries. Moreover, Enterprise Ireland found that, in the 1990s, MNCs were insisting on globally integrated component supply which was beyond the capacity of most Irish producers and essentially cut them out of the market for supplying (Breathnach and Kelly 1999). The net result was that MNCs were buying a substantially smaller share of their material supplies from Irish firms in the year 2000 than they had in 1990.

As the above figures show, the industry is dominated by overseas MNCs in every respect except employment. Microsoft alone accounted for at least 40 per cent of exports in 1995 (Forbairt 1996). The Irish side of the industry, on the other hand, consisted mostly of very small firms. In 1995, more than 250 of Ireland's 390 indigenous software companies employed fewer than ten people (the average indigenous firm employed fewer than fifteen). The software sector in Ireland, like the rest of the economy, is essentially dualistic - highly developed transnational giants alongside a scattering of very small domestic firms.

However, Irish software firms appear to do things that are more technically sophisticated, if not more profitable, than their TNC counterparts. The indigenous software industry is different. A fairly distinct and apparently growing local sector does small-scale software development, independently of the major MNCs. Many of these firms began by developing software services for firms in Ireland that were adopting computer systems, but they gradually developed their software applications into products they could sell in international niche markets. These companies, like small software companies elsewhere, survive by providing products whose turnover is too small to attract the major companies. Some Irish companies developed new software technologies but the most successful of them tended to be bought out by US firms, which removed their technologies to the US. The withdrawal of development functions to the US reinforces an existing tendency for low rates of R&D in the indigenous software sector. Survey research shows that expenditures on R&D make up about 12.7% of output, a level which one expert calls 'worrying' for companies in such a high-tech sector (Lucey, 1996). Moreover, expenditure on training fell after 1993 from 3.1 to 2.4% of revenues. Finally, in terms of size, indigenous software firms still account for less than 3% of Industrial employment. The Irish software sector, as O'Riain puts it, "cannot bear the burden of the huge expectations which have been placed on it" (1997, p. 24). The positive example of domestic Irish software, so far, is still too limited to counterbalance Ireland's rapidly increased dependence on a small concentration of foreign investors in electronics and pharmaceuticals.

Although the relationships between MNCs and local suppliers may be short-lived and, in some cases, parasitical, it could still be the case that sub-suppliers of MNCs gain enough knowledge or other resources through the association for them to be in a better market position when the sub-supply relationship breaks down. Supplier firms might gain access to otherwise confidential or expensive technologies, sources of raw materials or market intelligence from their MNC client.

This was not the case, however, in 1990s Ireland. Breathnach and Kelly's (1999) study of all indigenous establishments with ten or more employees asked whether local companies that act as subcontractors to MNCs are more likely to innovate in their products or production processes than companies who do not act as suppliers. The study found no statistical differences in the likelihood of innovation between the 174 companies with sub-supply relationships to MNCs and the 1,225 companies chat did not supply MNCs. In fact, there was a weak indication that suppliers of MNCs were actually less likely to innovate.

The fact is that MNC subsidiaries themselves rarely innovate because they perform very little R&D. This finding conflicts with the popular perception of the new MNCs of the 1990s, which, according to Barry et al (1999, p. 54), dramatically increased their rates of R&D spending in Ireland. Renowned international economists like Jeffrey Sachs (1997) and Paul Krugman (1997), also assert that the influx of high-tech foreign investments into Ireland in the 1990s brought a corresponding technology transfer, share this perception. But data collected by the state body Forfas show that R&D expenditures made up only 1.2 per cent of total MNC expenditures in Ireland, and 1.1% of indigenous firms' expenditures (as opposed to output), compared with an OECD average of 2.4%. In electrical and electronic equipment (the sector including computers), the OECD average was 5.6%, but computer firms in Ireland spent just 1.9% of expenditures on R&D (Breathnach and Kelly, 1999, table 11). In his study of technical workers in MNC subsidiaries in Ireland, McGovern goes even further. He quotes a MNC manager who insisted that there is no genuine R&D in Ireland, and he concludes that this situation will remain 'so long as the best engineers, chemists and technicians are employed by the branch plants of multinational corporations' (1998, p. 162).

This is quite different from East Asia, where subcontracting networks are more stable and dynamic. Irish subcontracting is 'flexible' but, for this very reason, it is insecure and its long-term sustainability is questionable. The sustainability of Irish indigenous industry became more questionable at the end of the 1990s. The indigenous share of profits fell from 51.5% in 1990 to less than 10% in 1999. This falling rate of profit was reflected in a sharp rise in the numbers of company failures during 1999-2000 (Canniffe, 2000).

This duality between a rapidly growing foreign sector and a stagnant indigenous one is shown most clearly in productivity figures for the 1990s. Output in the three US dominated sectors of computers, electrical engineering and chemicals grew by 375% during 1990-99 while employment grew by only 73%. This means that output per employee grew by some 215% or nearly 9% annually. In the rest of the economy - mainly Irish owned and dominated by services, construction and basic manufactures - output rose by just 55% while employment grew by 40%. Output per employee grew by less than 10% over the decade, or by about 1% annually, a near stagnant rate. The foreign sector was growing in an intensive way, by producing much more output without much additional labour. This is a feature of innovative economies, although the real dynamism of this sector is questionable since much of its value-added was a result of profit shifting rather than real increases of productivity (nsd.ie data, 2002 and HotOrigin, 2001).

Porter (1990, p. 679) acknowledges that foreign TNCs can sometimes serve to 'seed' a cluster, acting as sophisticated customers or related industries. It seems that the process referred to in that observation has a real significance in the case of the Irish software industry, and it may prove to be of some influence in other industries in Ireland given the relative scale of FDI in the country and indications of an upgrading in its quality (O'Malley and O'Gorman, 2001).

THE GEOGRAPHY OF THE IRISH SOFTWARE INDUSTRY

Citing data from a survey by the training agency FAS, Stern and Sheridan (1999) state that 83% of all software employment and 76% of all software companies were located in the greater Dublin area in 1998. Despite Dublin's undisputed status as Ireland's

leading city, it is strongly over-represented in software. For comparison, note that the Dublin region accounts for just 27% of Ireland's industrial establishments and 24% of its industrial employment. Dublin also has only 40% of Ireland's services employment (O'Gorman et al, 1997, p.15).

Further evidence of Dublin's pre-eminence in software comes from the widespread claim that it has become the premier location in Europe for MNCs in the software logistics and localisation sector (e.g. Coe, 1997). Also, some authors have argued that the indigenous software industry in Dublin has attained a critical mass, which has fostered the development of a local software culture (e.g. O'Riain, 2000). Finally, the FAS survey mentioned above found that Dublin was experiencing significant in-migration of software professionals.

The secondary centres of software industry activity in Ireland are the Mid-West region (notably Limerick-Shannon) with 6% of software employment, Galway with 4% of national employment, followed by the Cork in South-West region (Stern and Sheridan, 1999). Grimes (1999) speculates that the location of universities and airports has played a role in the emergence of these particular centres. The Limerick/Shannon cluster is composed of a group of foreign-owned companies in Shannon and an emerging cluster of indigenous companies at the National Technological Park beside the University of Limerick. In Galway, a number of overseas companies have branches in the business park on the university campus and some spin-off indigenous companies have emerged from university research centres. Software in Cork has lagged somewhat behind the smaller urban centres of Limerick and Galway, which Grimes (1999) suggests "may be due to the fact that the university was more closely related with electronics rather than software research" (p. 10). Cork Business Innovation Centre has been involved in recent efforts to foster the development of the local software industry.

In terms of the geographical distribution of overseas companies, the dominance of Dublin is clear. Just over two-thirds of all overseas software companies in Ireland in 2001 were located in County Dublin. Secondary locations for overseas software companies were Cork and Limerick/Shannon, with Galway being the only other significant location. As Table 6.7 shows there have been some changes in the

geographical distribution of overseas software firms since the early 1990s. Dublin's share has decreased slightly from 75% of firms in 1992 with Cork and Limerick-Shannon benefiting slightly and Galway emerging as a new fourth centre. It should be remembered that these relative shifts occurred against a backdrop of overall expansion, with all of the major locations having at least twice as many overseas firms in 2001 as they did in 1992.

Table 6.7. Location of Overseas Software Companies in Ireland 1992 - 2001

Region (main city)	1992 (number)	1992 (percent)	2001 (number)	2001 (percent)
Dublin	56	75.7	101	68.7
South West (Cork)	7	9.5	15	10.2
Midwest (Limerick/Shannon)	6	8.1	14	9.5
West (Galway)	1	1.4	8	5.4
Others	4	5.4	9	6.1
Total	74	100	147	100

Source: NSD/IDA data

On this basis, we find that 78% of employment in the Top 60 overseas firms (12,200 employees) is located in County Dublin; i.e. Dublin appears to have an even greater share of employment than of firms. Outside of Dublin, Cork, Galway and Limerick-Shannon each account for 5-6% of employment in the Top 60 overseas firms.

Using the list of 126 leading indigenous firms compiled by Crone (2002), analysis of this data shows 76% of Top 126 firms are located in Dublin. Cork, Limerick/Shannon and Galway are secondary centres but they are very small by comparison with Dublin, having no more than eight of the Top 126 firms each. In fact, only one of the Top 30 companies is based outside the Dublin area. In terms of employment, Dublin is even more dominant with 87% of employment in the Top 126 firms (Table 6.8). This means Dublin firms are larger on average than firms in the rest of the country. So whilst we might have expected the initial concentration of indigenous firms in Dublin to have lessened with time, this has clearly not happened; Dublin is as dominant as it was a decade ago, although we must remember the industry has grown significantly in all the main locations. By implication there are strong agglomerative forces sustaining the greater Dublin software industry.

Table 6.8. Geography of Leading (top 126) Indigenous Software Firms in 2001

Location	Companies (N)	Companies (%)	Employment (N)	Employment (%)	Average Size
Dublin	96	76	8,424	87	87.8
Cork	7	6	469	5	67.0
Limerick/Shannon	7	6	275	3	39.3
Galway	8	6	226	2	28.3
Other	4	3	134	1.5	35.0
Unknown	4	3	140	1.5	33.5
Total	126	100	9,688	100	76.9

Source: Crone (2002)

As we see being part of the software industry in Ireland does not herald some simple shift to a world of pure absolute mobility where location no longer matters. Rather, as we see with the case of Dublin time and space barriers have become reconstituted and reformed within global geometries of flow, incorporation and exclusion. The Celtic Tiger phenomenon demonstrates very distinct geographical frequencies. It is very much an 'urban tiger' that has made its den in the Irish capital and can be seen occasionally roaming the streets of the second tier cities of Ireland.

One of the primary factors which makes these urban locations attractive for new investment are economies of scale associated with their size, access to a large pool of labour skills, to vital transport connections, and to information and telecommunications infrastructure. Despite the fact that the new technologies facilitate the dispersal of economic activity internationally, this does not mean that within a given country like Ireland we can expect a greater dispersal of new investment. The evidence in recent years would suggest a high level of concentration of such investment in the large urban areas, particularly in sectors which are major users of the new technologies such as software and telemarketing (For example the current roll-out of broadband infrastructure in the state). Bearing this in mind let us now take a look at the regional aspect of the Irish software Industry.

Uneven Development.

As the above section has shown there is a very distinct geography behind the Irish software industry, this section wishes to deal with that geography on a regional basis.

Looking at Map 6.1 and table 6.9 in tandem helps visualise the difference between regions in terms of destinations for software industries.

Table 6.9. Irish Software Industry by region

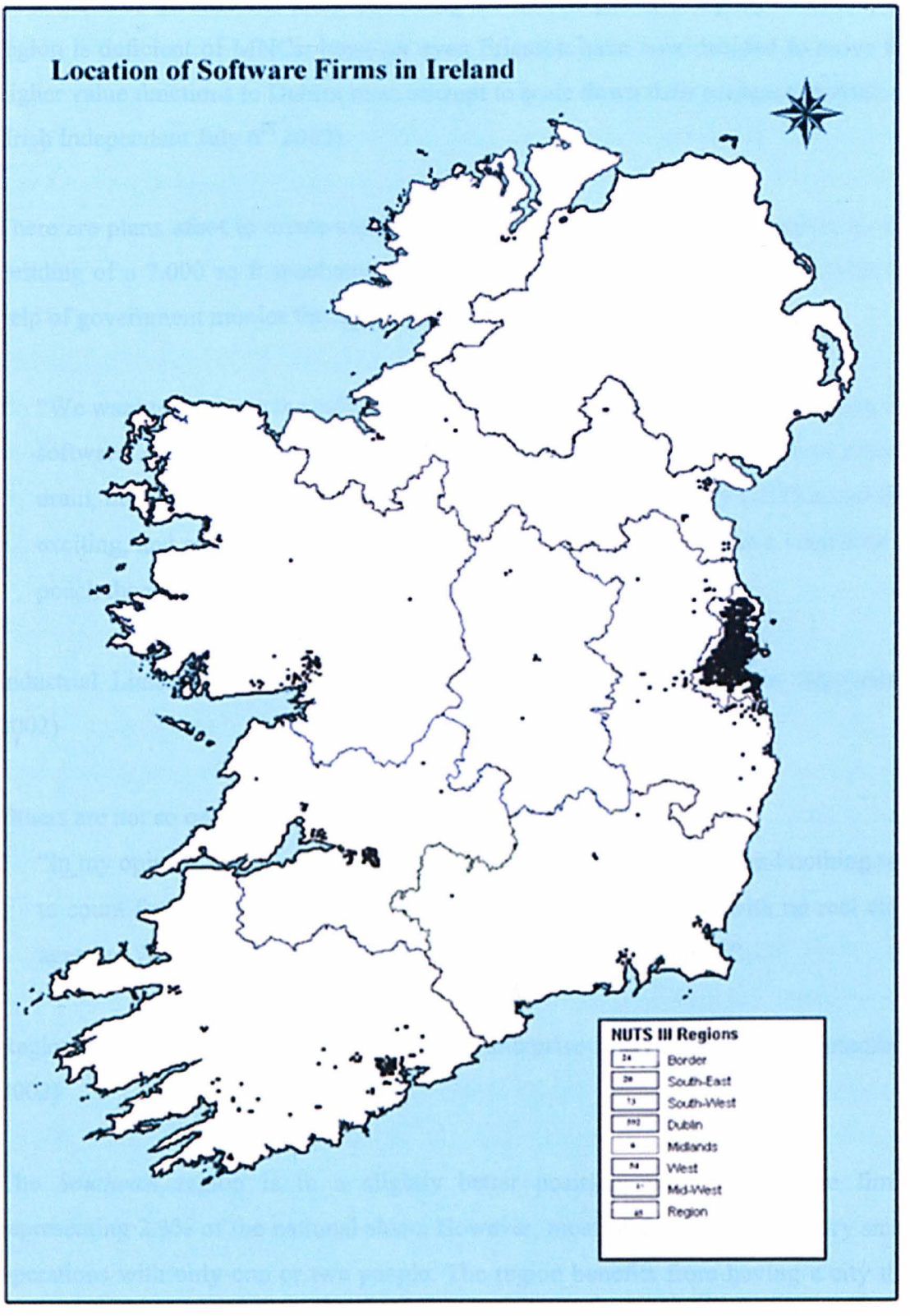
Region	Software Firms (%)	Indigenous	Overseas	Percentage Overseas	Per km square
Midlands	6 (0.6)	5	1	16%	0.0009
Border	24 (2.7)	21	3	12.5%	0.002
Mideast	45 (4.6)	41	4	9%	0.007
Midwest	45 (4.6)	30	15	33.3%	0.005
Southeast	20 (2.3)	18	2	10%	0.002
Southwest	73 (8.4)	55	18	24.5%	0.006
West	54 (6.2)	45	9	16.5%	0.003
Dublin	592 (69)	443	149	25%	0.6
State	859 (100)	662	197	22%	0.012

Source: Authors Calculations from NSD and IDA data

The figures and the image serve to back up ideas already expressed on the outright dominance of the Dublin region in terms of the software industry. Map 6.1 shows that clusters of significance have formed around the second tier cities - most notable Galway and Cork, with Limerick (mostly made of the National Technology Park cluster to the north of the city) and Shannon. The latter serves as a great example of how smaller towns can actively attract software firms.

Outside of the Dublin region, the remaining regions can be divided into two groups; those with some software presence and those with practically no software presence. The latter group contains the Midlands, Southeast and Border regional authority areas. The three have much in common, they are overly dependent on agriculture, primarily rural and both the Midlands and Border region lack a major city to focus on. Together the three regions account for just over 5% Ireland's software companies.

Map 6.1 Location of Software firms



Source: (Author calculations, NSI database 2003)

The *Midlands* region is specifically devoid of companies working in the sector, with only six companies registered with the National Software Directorate it accounts for a mere 0.6% of the national total. Excluding the mobile phone company Ericsson, the region is deficient of MNCs, however even Ericsson have now decided to move the higher value functions to Dublin in an attempt to scale down their presence in Athlone (Irish Independent July 6th 2003).

There are plans afoot to create some form of software presence in the region, by the building of a 7,000 sq ft incubator unit by Athlone Institute of Technology with the help of government monies through IDA and Enterprise Ireland:

> "We want to promote the college as a business friendly environment especially for software... the low level of innovation is a key issue, here we suffer from a brain drain, the simple fact is that the Athlone Institute of Technology (AIT) is not that exciting, and so the talent leaves for the brighter lights and we have very little to poach them back with, that is the real challenge for the region"

Industrial Liaison Officer, Athlone Institute of Technology (Interview September, 2002)

Others are not so optimistic:

> "In my opinion there are too many strategies; too many strategies and nothing real to count for it. People are working together on so many things with no real clear agenda...We have made an industry out of planning in this region"

Regional Director of the Midlands region - Enterprise Ireland (Interview September, 2002)

The *Southeast* region is in a slightly better position with 20 software firms, representing 2.3% of the national share. However, most of these firms are very small operations with only one or two people. The region benefits from having a city that forms a focal point. Waterford City is home to six software firms, one of which is a US MNC. The only indigenous company of note in the region operates out of

Enniscorthy (county Wexford) employing 160 people, Datapac is a software consultancy that also has two offices in Dublin.

Of the 24 software companies located in the *Border* region, nine are situated in what could be termed one of the region's significant clusters; in and around Dundalk town. The other cluster is based on the Finiskin industrial estate in Sligo town. The estate is home to four indigenous companies, three of which are involved in developing their own software products. County Donegal is home to one other firm of note; The Remote Viewer Ltd. operates out of Clonmoy. This small firm employing 8 people is dedicated to developing GIS packages, however, it is its origins that are most interesting, coming out of the Geography Department of the University of Ulster in Coleraine some 40 miles away across the border. While the region has a relatively small presence of software firms, many of the firms that are present have a dynamic base and a robustness that is necessary for any company based in Ireland's poorest region.

The second group of regions with a greater software presence are the Mideast, Midwest, West and Southwest regions, which account for nearly one-quarter of the nation's software companies. With the exception of the Mideast, all these regions have the focal points of Ireland's second tier cities. In the case of the *Mideast*, however, it has benefited from its proximity to the ever-expanding capital city. As we can see from Map 6.1, the majority of companies in the Mideast region actually cluster around the border with the Dublin region, in what can be described as a spill-over fashion. Nearly half of the regions' companies are located in the Wicklow town of Bray, which now acts as a commuter-town for Dublin city. Software Development and solutions along with consultancy make up for most of the activity of firms in the regions. The majority of these firms are single operations employing on average 10 people. There are also two university spin-outs present in the region, both Eclipse Internet Solutions and Periander Technology came out of the computer science department in the National University of Ireland, Maynooth.

The situation in the *Midwest* region is somewhat different. The region is noted, firstly for the fact that one-third of it's software companies are overseas MNCs, and secondly, for its two major clusters of international significance; Shannon and the

National Technological Park (NTP). Together both clusters account for nearly 70% of the regions companies and are home to global names like Dell, Blackbird and Tellabs and some of Ireland's biggest players in the software sector, most notable Piercom Ltd and Shannonsoft.

The fact that a vibrant indigenous industry has grown alongside the multinationals is proof that some of what is being done there is right.

> "We came out of UL and after we ran out of space there we moved here. It is great, will still have our contacts with UL and we still take on graduates from there. What was also good about the location was that at first we did quite a bit of out-sourcing for Dell, which helped us get on our feet"
>
> Publicity Officer - Piercom Ltd (Interview August, 2002)

The *West* region in many ways resembles a miniature version of the software scene across the whole country. The region includes three counties, Roscommon, Mayo and Galway, it is the city of Galway that accounts for nearly three-quarters of companies located in the region. Within the city itself there are notable clusters of firms in certain industrial estates, most notably Ballybrit industrial estate on the east side of the city with eight firms and IDA Dangan innovation centre on the North of the City with six. Also significant is the location of five software companies six miles west of the city in Ná Furbacha. Here we see a small cluster of primarily web-design and translation companies. Their cluster is a direct result of an initiative carried out by Udaras na Galethacta, the Irish speaking development agency in charge of Irish speaking areas. The city is home to some big names including ADC and Compaq who employ over 600 people in Galway city. As already mentioned the closure of the town's biggest software employer - Digital - had a series of effects, not all negative. Indeed, on the whole many of the companies interviewed in Galway saw two different sides:

> "Well there is a positive and a negative side to being in the West of Ireland. In the boom times we couldn't get people when they were asking for exorbitant amounts of money. But being in Galway and relatively close to such a clean environment makes it an attraction for certain types of people who were willing to take less

money to be here (and the whole less traffic etc) made it an advantage. Nowadays it's the opposite – being in the west when all the markets have retrenched there is not much around so now we have to work harder and travel further so that's the downside. When times are good, geography really doesn't seem to matter, but when they're bad it really begins to matter."

CEO Bluechip Technologies (Interview May, 2002)

The County of Cork dominates the *Southwest* region in terms of software companies, being home to 63 firms, the remaining ten are located in county Kerry. The same dominance does not translate for Cork city however, with 33 firms situated in the LUTS area, it is behind Galway and only slightly ahead of Limerick (both of which are considerably smaller cities). The county does boast some other significant clusters in towns such as Ballincollig, Mallow and Cobh. While in county Kerry the only significant cluster exists in and around Kilarney and the Kerry Innovation Park.

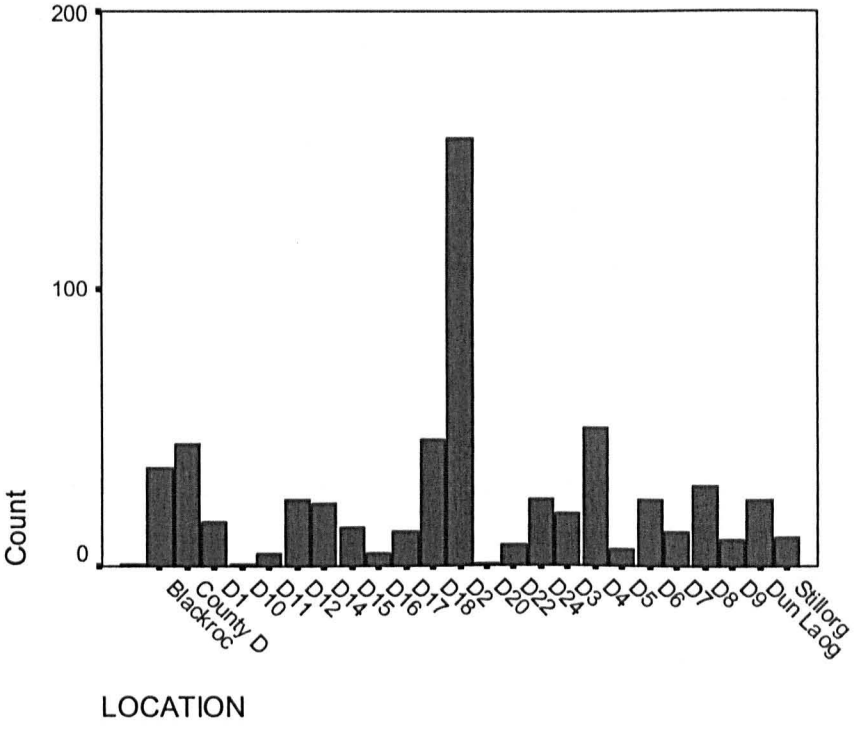
Of the firms located around Cork city, a great deal of them are MNCs including some of the world's biggest names like Alctel and Logica, both of whom employ over 700 people each. The nature of the work carried out by most of these firms is often lower level assembly line work with little value added. Their draw to the city is due to the critical mass there and the pools of labour it provides.

"Well our first instinct was to go to Dublin. Looking at the costs there, we started looking to somewhere else in the country. The IDA pointed us west, we decided that south and Ireland's second city was our best option, owing to the labour intensive work we do here"

Manager CMG Telecommunications (Cork) Interview, August, 2002

As Map 6.1 shows the dominance of the Dublin region in the software sector is unquestionable. With nearly 600 software firms it has one of the highest densities of software firms per square kilometre in the EU.

Figure 6.8. Location of Software Firms in the Dublin region



As figure 6.8 shows, within the region there are some specific clusters of note. Outside the city in suburbs such as Blackrock and Stillorgan we see the presence of cluster equal in size to those seen in Ireland's second cities (Galway, Cork and Limerick). While in one specific area of the centre of Dublin city, Dublin 2, we have 155 software companies (primarily indigenous) a significant cluster by any means.

Multinationals in the Dublin region include some of the biggest names in the business from Microsoft to Intel to Motorola. The nature of the work of MNCs can be seen in their employment figure. MNCs make up one-quarter of software firms in Dublin but account for over 45% of software employment in the region. The location of these companies tends to be on the outskirts of the city where the land is cheaper and better able to house large-scale operations.

All of Ireland's leading software industries (the biggest employers and those with the highest stock market share) are also located in the region. Some of these companies boast high international linkages and some have office in the West and Southwest, but so far this number is few, somewhat to the disdain of policy makers:

"Our focus for new industries is to persuade them away from Dublin with more attractive packages for the regions. We also ask Dublin companies who are thinking of opening a second office to do so in the regions. But this has not proved to be easy, companies take a lot of financial persuasion to move out or start up away from Dublin where they believe the action is"

Regional Director - Enterprise Ireland (Interview December, 2002)

The international links are many and help put Dublin on the map for software. Of the 12 biggest US multinationals operating there, 6 are using Dublin as their European headquarters, which in turn adds a greater weight to the city's mass in terms of command functions.

The structure of the software industry in Dublin is diverse and can account for most if not all areas of the industry. Consulting, Software development and Solutions make up the greatest numbers as they do around the rest of the country. But unlike the rest of the region's sectors such as multimedia and especially financial software are very significant while they account for little to nothing in the rest of the country.

Conclusions

What we have seen here in terms of a booming software industry is directly related to the policies pursued in Ireland that were described in Chapter 5. Ireland's top-down/supply-led industrial policies have seen the country become a world leader in software. Indeed, the software industry, above all others, epitomises Ireland's economic success in the 1990s. Ireland was hailed as a 'high-tech economy' and a leader in the information age; and software was seen as its main driver.

Correspondingly, all over the world the software industry is seen as one of the main pillars of the information driven, knowledge economy. It is labelled as a new industry for the new economy. Technological determinists hold it up as the 'holy grail' of development in the information age. Software firms are thought to rely on wires and information, not roads and physical inputs. This is part of the attractiveness of developing a robust software sector to aid spatial development in the information age.

From the above analysis, we can now appreciate that the story of development in the information age is not so straightforward. We only need to scratch the surface to see that the Irish software success story is quite literally the tale of two industries: that of the Multinationals and that of the Irish owned firms. O'Riain (1999) calls this the 'two globalisations of Ireland'. Ireland became a world leader in software both because it was the desired location for MNCs to set up in Europe and because its own firms are hatching links with other companies abroad.

Once we recognise this fact, we begin to interpret the software sector's success in a different way. In terms of output and export revenues, the indigenous industry is dwarfed by the multinational. Irish operations look miniscule in terms of the numbers employed when compared to their foreign-owned counterparts. There is also a wide disparity in terms of the focus of each of the sectors, with much of the work done by the multinationals amounting to little more than assembly line manufacturing.

While Irish firms may be involved in higher-value added work such as product development, we must appreciate that this is on a comparably minute scale. The differences between the two sectors *could* be excused and even deemed a success by policy makers advocating the attraction of inward-investment in order to stimulate growth in the indigenous sector *if* there was some evidence that a trickle-down effect had actually occurred. However, no such evidence exists; the links between the two sectors in terms of spinouts and subcontracting etc. are virtually non-existent. What we actually have in Ireland is two separate entities under the one industry.

The dominance of Dublin in this industry is also of special importance to this work. Not least, because it can be seen as empirical evidence of the significance of space in the high-tech industry. Dublin is a 'sticking point' in the Irish context and in terms of this industry it seems almost futile to compare on a national scale, because what is going on in Dublin in terms of software needs to be looked at on a different scale; the international one. When employing the term Celtic Tiger, analysts use it in relation to Ireland's impressive economic growth throughout the 1990s. They often back up the term with statistics from the software industry in the country which is interpreted as demonstrative of growth in the new economy of which Ireland is a supposed key actor. What the above analysis shows is that the figures, for the most part, relate to Dublin and only a few clusters outside of the capital city. This proves to be of prime interest to my work which seeks to uncover the link between regional development and new information and communication technologies. The fact remains clear in Ireland, the moving of an economy into high-tech activities as seen in the software industry, by no means entails a uniform regional development.

While there is no doubting that the Irish software industry experienced phenomenal growth over the 1990s, this chapter has proved that the success has not come without some faults. In many ways the software sector that we now see in Ireland could have been predicted. The pursuit of incentive-led attraction of inward-investment was and will imply some difficulties. Subsidising rents and labour along with a low corporation tax will attract industry, but the question is what type and to where? In Ireland, the answer has been, low-value added manufacturing and to the bigger cities. Global production networks influence the former and economies of scale the latter. Ireland was an attractive proposition to many MNCs because of its cheap pools of

well educated labour and the low cost of setting up larger production complexes. In a world where production chains were increasing in size, Ireland proved a perfect fit for the assembly stages of the production of software products and services. Economics and critical mass brought these complexes to Ireland's larger cities and towns, effectively ignoring the lesser developed areas which served to exacerbate the problem of uneven regional development in the State. So while Ireland has benefited in many ways from the top-down industrial policies pursed by its policy makers, in terms of attracting some of the world leaders in the software industry, the end result, for the most part, has seen them set up their lower-value added production processes in Irish cities; a stage with little R&D that lacks embeddedness and does little to stimulate the development of a robust indigenous sector alongside it.

CHAPTER 7: AN ISLAND OF REGIONS: REGIONAL POLICY DEVELOPMENT IN IRELAND

Introduction - Perspectives on Regional Policy

The Regional Information Society Initiative can be interpreted as an attempt by the European Commission to put an end to increasing regional divergence in the new economy. The last chapter is an example of how, if unchecked, the information age economy can amplify regional differences. As a result of Ireland's head-first dive into the information economy, it is clear that it too needs to address problems of regional divergence. Chapters five and six gave an understanding of the development of the Irish economy and the software industry and how Statist policies had affected both. The final section of the last chapter showed the regional bias behind one of Ireland's most prominent industries. This chapter will further this by both looking more closely at regional development across the State and the regional policies behind it.

To talk of an Ireland of regions may be a misnomer because of the relatively small size of the State and its high level of integration in both the European and the Global economy (Buttimer, 2001). Having said that, this chapter will argue that to ignore an Ireland of regions is to commit a serious error. For too long Irish policy makers have been concentrating on the national level, the result of which has led to massive bottlenecks and congestion in the main cities, all to the detriment of the performance of the country as a whole.

One of the reasons for the lack of any coherent regional policy in Ireland could be due to the unitary nature of the State and the absence of any form of regional autonomy. In fact, it must be stated that the Irish system of governance is one of the most centralised of any European country. As will become obvious in this chapter, regional policy in Ireland is largely synonymous with economic policy.

Referring back to Chapter two, I will take a brief look at the evolution of regional thinking and with reference to Chapter five show its evolution in an Irish context. Here I look at the evolution of regional policy, with special reference to my case study regions. I compare the Irish RISI regions (Midwest and Southwest) to two non-RISI

Irish regions (Midlands and West) and how policy has affected both sets. The original rationale behind this was to compare the former 'policy-on' regions with latter 'policy off' regions. The Midwest and Southwest, through their participation in RISI were seen as regions adopting a more bottom-up, demand-led approach while the Midlands and West regions were assumed to follow the national lead of a more policy off, supply-led approach. As we shall see, the delineation of these regions did not prove so straightforward. The remainder of this chapter looks at this and uses a study of broadband infrastructure to highlight the continuing unbalance.

Box 7.1 Theoretical Perspectives

Time Period	Policies	Theory and Theorists	Evolution of the Information Society
1950's-1970's	**State-led Policies** State-owned telecoms State as Animateur	**Keynesianism** Perroux, Myrdal, Kaldor	**Military dominance** State ownership / R&D
1970's-1990's	**Market-led Policies** Liberalisation Liberalisation of Telecomms	**Neo-Classicism** Bradfield, Armstrong and Taylor, Batty, Friedman	**Through business into society** Dataprocessing - PC's and supply-driven policies - R&D in the private sector
1990's-onwards	**The 'Third-Way'** Institutional thickness Learning policies	**Institutional / post-Keynes** Amin and Thrift Cooke, Morgan	**Knowledge focus** Public private partnerships R&D between Universities, State labs and private labs

Box 7.1 is a schematic overview of international development policies. From it we see the shifting patterns and scales of development policies over the last 50 years. As we can see, notions of developing a region changed from developing the nation in the 1950s through to creating a global presence in the 1970s before coming down to the

local scale in the 1990s which argues for development from within the region (Castells, 2000).

The first generation of regional development models of the 1950s and 1960s were associated with the so-called Fordist approach to production in which large international companies engaged in vertical disintegration strategies (creating branch plants) and favoured a geographically dispersed pattern of investment. At the same time national governments intervened to influence location decisions of corporate organisations through a variety of measures such as financial subsidies, public infrastructure investments (roads, industrial estates, etc.) and favourable tax concessions. The centralised top-down approach to regional development tended to produce short-term benefits such as additional employment but it did not lead to a dynamic self-sustaining growth model. In this approach there was an over-reliance on inward investment and insufficient support for strengthening the indigenous sectors of regional economies (Amin and Thrift, 1994). There were a number of fundamental weaknesses such as a failure to encourage innovation, a tendency to foster a dependency culture, and an inability to understand the territorial dimension of productive systems. Attempts to promote regional growth centres generally failed for a variety of reasons including over reliance on inward investments, lack of integration mechanisms, and an absence of sufficient political will to take the decisions required to make the strategies work (Cooke and Morgan, 1998).

Since the late 1970s there have been a number of major revisions in regional development theory leading to new policies and strategies that favoured a more territorial based approach. Maillat (1998) contends that from the early 1980s a second generation of regional policies began to emerge. Changes in the overall context for economic development resulted in regionally differentiated responses leading to the further decline of some older industrial regions, but also the simultaneous emergence of a new dynamic region - in places as diverse as north-central Italy, southwest Germany, west Denmark, southwest Norway and parts of Austria. The strategies adopted in these regions have attracted much international attention which has resulted in attempts to identify the main factors that have contributed to their success (see for example reports prepared by Cooke (1996) for the National Economic and Social Council and by Dunford and Hudson (1996) for the Northern Ireland Economic

Research Council). A key outcome from studies of these successful regions is that the development process is largely driven from within the region. The distinguishing feature of this approach is that strategies are directed towards encouraging innovation, promoting networks and collaboration between all the main agents, and utilising the full potential of all of the region's resources rather than seeking to attract branches or subsidiaries of larger companies from outside the region. Towards the end of the 1980s the effects of globalisation on production systems and on regions or localities were becoming clearer. The impacts of information and communication technologies, and the adoption of more flexible forms of production, work and inter-firm relations have placed much greater emphasis on innovation and on the capacity of firms to incorporate new knowledge and to assimilate or develop new production technologies (Malecki, 1997).

The previous distinction between exogenous and endogenous approaches to regional development had become less valid. The focus shifted in third generation models, to what have been described as intangible factors in the development process. These included a greater emphasis on improving the capacity for development at the level of the firm, the industry and the region. This especially involved supporting measures aimed at encouraging innovation, promoting information exchanges and adoption of best practices (in areas such as management, design and quality assurance, new technology, marketing) via networking mobilising new financial sources, and fostering collaborative approaches based on principles of partnership to the design and implementation of regional programmes. The objective here was to ensure that there was a supportive local or regional milieu in which an additional form of capital, namely social capital, could be created and linked to the other forms of capital in a manner that resulted in added value for the region. The processes involved in creating social capital appear to work most successfully at the regional and local levels. They rely heavily on actors to interact and facilitate information sharing and learning by all the key actors in the region - hence the term 'learning regions' has been applied to places where this strategy has been successfully pursued (Simmie, 1997). Learning regions do not emerge spontaneously, rather there is a need for agencies and authorities to play an animation or catalytic role leading to a cultural change in relation to enterprise development (Morgan and Nauwelaers, 1999). Drawing on the

findings of research undertaken by the OECD, Maillat (1998) identified a number of measures that characterise third generation regional policies. These include:

- maintaining and developing specific and strategic non-material resources such as know-how, training and trust;
- selecting and managing key information relating to the development of markets, technology and other competitor region;
- building up a critical mass through networks, and;
- forging new alliances in order to develop inter-regional forms of co-operation.

These changes in policy design indicate the need to interpret the level of development of a region not only according to quantitative criteria but attention must also be given to the qualitative dimension of development. Thus while a regional strategy will seek to increase output and employment and reduce unemployment, the factors that are most likely to determine the capacity for productive restructuring and potential are the regional innovation rate, the level of skills in the labour force, the technological and managerial capacity of the firms, the flexibility of public and private organisations, and the integration of the firms, cities and regions within competitive and innovative networks (Cooke, 1996: Vazquez-Barquero, 1993).

How has Ireland compared to the international perspective/theory?

Owing in part to the unitary nature of the Irish State its approach to regional development has been at best 'patchy'. As is the case with most European countries (and with the Union as a whole) the objective of balanced regional development is high on the political agenda in Ireland. For the most part policies that targeted enhancing the productive potential of less prosperous regions were preferred to income transfers. This section will explore Ireland's approach to regional development over the last 50 years and compare it to the international perspectives and theory. In doing this I will divide Ireland's regional policy experiences into three separate eras. The policies that differentiate each are analogous to the theories that differentiate the eras in Box 7.1. I start with regional policies of the 1950s, policies very much steeped in the theory of the time, where we see the State as animateur with an active role in the pursuit of balanced regional development. This contrasts with the

second period of analysis which commenced in the 1960s/70s where we see the State virtually remove itself from the process in favour of a more market oriented approach. Finally, I will look at the most recent turn in spatial policy in Ireland; back to the region. This policy has placed the emphasis on local actors and the promotion of collaboration between these actors in order to promote the development of Irish regions.

Due to the turbulence of the first few years of the Irish State and the policies of proctectionism pursued thereafter, regional policy featured very little in the first 30 years of the Irish State. In the 1950s, however, the attitude changed. What began to concern the government most was the steady decline in the rural population of the west coast of Ireland. The **1952 Underdeveloped Areas Act** was the State's first attempt at pursuing balanced regional growth. In its conception it can be seen as more of an income transfer approach than in any way promoting the productive potential of the West. The Act provided employment grants for manufacturing industries in the designated counties of the West, referring to Box 7.1 above we can see the role that the State had taken on was one of animateur. Grants were also given for building and equipment in order to promote small-scale rural industries in these areas but the success of the scheme was limited and the high rate of emigration persisted (O'Neill, 1971). The high level of assistance (for building and equipment costs) amounted to up to 60% for both foreign and indigenous industry. The organisation in charge of the distribution and grants was an industry institute named An Foras Tionscail (Bannon and Greer, 1998).

Judging the regional benefits of the new policy proved very difficult because of the fact that by 1954 assistance was given to every manufacturer outside of Dublin. From the very start it was obvious that regional policy would prove difficult in Ireland - politics in Ireland has long been and remains very much a local issue. There is a pervasive 'me too' mentality and if one county receives employment grants all other counties feel they deserve them (IDA, 2001). By the early 1950s the government became concerned with the need for structural transformation and industrialisation throughout the whole economy and preferential treatment for the West, while still maintained, was made gradually subservient to the needs of the national economy as a whole.

However, as international perspectives on development began to change so did Ireland's approach to development. The Industrial Development Authority (IDA) Act in 1950 is generally seen as the first move against the protectionist policies of the two previous decades. The Act established the IDA which was charged with the promotion and development of Irish industry and has now evolved into Ireland's principal development agency. It worked as an autonomous state-sponsored body and the function did not only include the promotion of inward investment and indigenous industry, but also the provision of information and advice, the development of industrial infrastructure and the award of incentives such as capital grants. The IDA (now split in two with the Industrial Development Agency supporting foreign investors and Enterprise Ireland supporting indigenous ones) has been the only state institution with a regional focus: all other state development bodies work on the national scale.

In an attempt to move away from regionally differentiated grants after the enactment of the both the Underdeveloped Areas Act in 1952 and the Industrial Grants Act of 1956, the Government, in the latter part of the 1950s passed two Acts, the first in 1957 (the Gaeltacht Industries Act) establishing Udaras Na Gaeltachta and the second in 1959 (Shannon Free Airport Development Company Limited Act). The former created a development agency still in existence today purely concerned with the development of the Gaeltacht Areas of Ireland (see map. 7.1). The latter, established the Shannon Free Airport Development Company Ltd (now Shannon Development see chapter four) another development agency this time concerned purely with the development of the Shannon region.

Map 7.1 The Gaeltacth Areas

Source: Udáras na Gaeltacht

The Local Government Planning and Development Act of 1963 came into force in 1964. A major element of this legislation was developmental and it was envisaged that Local Authorities would become development corporations for their areas. County Development Teams soon followed to build on this role. However the promise was never realised due to lack of resources and any funding at the local level. Again the Local Government Planning and Development Act of 1963 made no reference to regionalisation despite Government pronouncements on the importance of establishing a regional physical-planning framework (O'Cinnede and Grimes, 1992). This Act saw the Government establishing nine regions for physical planning purposes although no statutory powers or functions were conferred. The growing interest in regionalism also led Bord Failte (the Irish Tourist Board) to establish eight regional tourism organisations to promote tourism within their own areas.

Ideas of regionalism were on the increase in the 1960s. However, good intentions do not always make for good policy. It proved hard to divide Ireland into functional economic and social regions. While the regions of the East and Southwest had both the economic and cultural links, the regions of the North and West proved less easy to bind together:

"The basis for their delineation appears to have had all the precision normally associated with the business of pinning the tail on the donkey" (O'Neill, 1971: 61)

The establishment of Regional Development Organisations in each of the regions in 1968/1969 gave formal recognition for the first time to regions. The RDOs were given responsibility for co-ordination at regional level and to provide advice to the Government in relation to regional planning and development and investment needs. Regional reports were prepared and strategies developed for each of the nine planning regions based on their overall development needs. The Industrial Development Act of 1969 gave the IDA a formal statutory regional remit.

Several regional studies were commissioned by the Government among them were a survey of the Limerick region by Nathanial Lichfield and associates in 1966 and a study on Dublin by Myles Wright in 1967. However, what was considered as the most comprehensive regional survey undertaken in Ireland was published in 1968 (Foras Forbartha,1968). Known after its main author Colin Buchanan, the terms of reference of the Buchanan Plan instructed the team to "indicate growth potential, identify possible development centres, establish the level of needed in the infrastructure to facilitate growth, and make proposals for policy decisions to be taken by the Government, including measures to implement such proposals" (ibid. p.i).

The Buchanan Plan (1968) postulated five alternative strategies (summarised in box. 7.2) ranging from extreme concentration to extreme dispersal of industrial activities.

Box 7.2 The Buchanan Plan

Strategy	*Comment*
Concentration of investment in Dublin	*Probably would lead to the fastest rate of industrialisation and economic growth but would undoubtedly accentuate regional imbalances*
Concentration of investment on Cork and the Limerick/Shannon complex	*This would also lead to increased industrialisation and economic growth but would contribute very little to the development of the country outside the Southwest*
Continuation of present policies	*Already proved unsatisfactory and provides no hope of halting the decline in rural populations or eliminating unemployment*
Distribution of investment over a larger but still relatively limited number of growth centres (Dublin, Cork, Limerick/Shannon, Galway, Waterford, Dundalk, Drogheda, Sligo and Athlone)	*This would provide a growth centre for each of the nine planning regions and would lead to a reduction in unemployment/emigration. However, not as quickly as the first two*
Even greater emphasis on a more widespread dispersal of industry	*While politically more popular, the resulting benefits would be much less than with any other strategy and industry would be less capable of withstanding foreign competition*

(Buchanan, 1968)

While it was widely recognised (Drudy and Boylan, 1987) that while it might not have been the best strategy, Buchanan proposed the identification of nine growth centres in which industrial policy would be focused. The growth centre approach, which claimed that the spatial allocation of investment in industrial development should be concentrated at selected points rather than follow an even distribution, had gained widespread acceptance at this time (Drudy and Boylan, 1987). Thus, in order to implement Buchanan's policy, hard political choices would have to be made in order to identify those growth centres that could sustain development.

"To him who hath shall be given" one journalist summed up in Biblical terms the recommendations of Buchanan. The nine growth centres identified were the nine richest cities and towns in the country, with vast swathes of the country ignored. At the time of his recommendations, Buchanan may have known the local nature of the

Irish political system, which may explain his rationale for choosing nine growth centres over four or five (which he maintained would bring greater growth). In the end however, even the nine growth centres proved to be too few and in their stead a total of 47 town clusters, comprising 177 towns, were earmarked, with specific job targets being set for town clusters. The result saw the Government pursue the politically easy option by favouring wide dispersal of growth. Buchanan's proposals were over-turned following strong political resistance; in effect political expediency dictated that funds had to be spread more equitably (O'Leary, 2001).

Armed with the Buchanan Plan and the regional reports from the RDOs and the IDAs regional industrial plans, the Government in May 1972 issued a statement on regional policy. The statement indicated that the Government had decided to pursue an overall regional strategy that should not merely seek the attainment of acquired national growth rates but should also provide for the maximum spread of development to all regions. The strategy, which the Government adopted and wished to pursue over the next 20 years, was as follows:

- Development of Dublin to be such as to accommodate the natural increase of its existing population;
- Expansion in and around Cork City, the Limerick /Shannon/Ennis area and of Waterford, Galway, Dundalk, Drogheda, Sligo and Athlone;
- Development of county or other large towns of strategic importance in each region, including relatively large expansion of towns in areas remote from existing major towns;
- Continuation of special measures for the development of the Gaeltacht (IDA, 1972).

According to the Director of the Midlands Regional Authority, the 1972 statement was:

"arguably the most important statement on regional policy in Ireland"

(Regional Director of the IDA, Midlands, Interview, May, 2002)

The reality could not have been further from the truth. The 1972 statement was closer to a national policy of Laissez-faire than anything inherently regional in focus. The main declaration was more akin to an identification of the places that had the greatest growth potential in any case. It was an announcement that came down to little more than a decree that Dublin was going to continue to grow unrestricted.

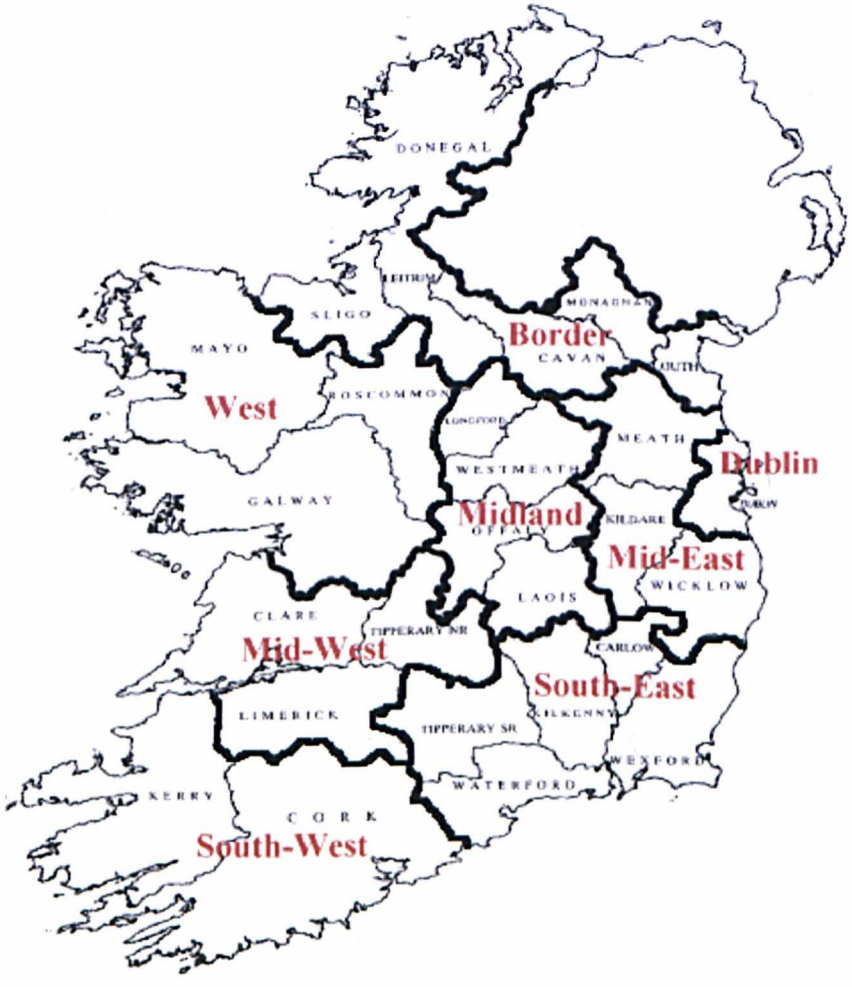
During the late 1970s and early 1980s, the now widely documented poor performance of the Irish economy coincided with substantial job losses, especially in indigenous industry. Problems surfaced concerning the low degree of linkage between foreign multinationals and indigenous industry. These problems were partly attributable to the lack of embeddedness by multinationals in the local economies. However, they also stemmed from the fact that many foreign operations were basic assembly with low-value added, offering limited opportunities for spillovers to indigenous industry.

The response of the IDA was to shift from an explicit regional focus to a strategic industry approach. Thus, by the 1980s the policy was to attract high value added companies in high growth sectors, and to develop a sustainable number of companies in these sectors. By the 1990s concentrations of companies had emerged in the computer, electronics and pharmaceutical sectors located in and around urban centres, such as Dublin, Cork and Limerick.

In addition, during the late 1980s and 1990s, much of the policy agenda was focused on the use of the substantial funding available through the EU Structural Funds. Accordingly, funds were targeted at the development of indigenous industry, physical infrastructure, human capital and local development. It is not clear that coherent regional strategies were followed in the use of these funds. While funds were allocated to regional authorities, the process by which this was accomplished was political rather than economic in nature, with little attention being paid to developing regional economic strategies. Moreover, the fact that for EU purposes Ireland was treated as one region meant that less attention needed to be devoted to developing coherent regional policy among Irish regions. Indeed, this point cannot be underestimated, whereas as other regions in the EU had to produce their own, single programming document, the Irish regions were grouped under one document for the whole of Ireland (European Commission, 1994).

The **Local Government Act 1991** can be seen as a step taken by the Government to overcome this. Section 43 of theAct saw the establishment of eight Regional Authority Areas (NUTS 3 level) consisting of specified counties and/or county boroughs and their members of council (see map 7.2). The Regional Authorities were set up in the major towns and cities in each of the eight regions and were responsible for the co-ordination of public services in the regions, for planning the regions overall development requirements and the subsequent monitoring and evaluation of EU structural funds.

Map 7.2 Regional Authority Areas as Defined under the Local Government Act 1991



Source: Regional Association

The delineation of the eight regional authorities was logical for regions like the Southwest, where the close alliance between counties Cork and Kerry made it a

functional region. It was a similar case for the Midwest and Southeast regions. According to Jim McGovern, Director of the Western Region:

> "The way they [the regions] were set up was pretty rudimentary, but the WRA made a lot of sense, because Galway, Mayo and Roscommon had already made up the western health board and the fisheries board. Also for the reason that Galway dominates the region, in that the commuting belt extends to all counties of the region, that is county Galway, Mayo and Roscommon. This gives it some coherency as a region, whereas in the Border region you wouldn't have that at all, counties in that region have very little in common, except for the fact that they straddle the Border. I suppose the other regions do make more sense, Dublin and the Mideast for example."
>
> Interview May, 2002

People in the Midlands also questioned the rationale behind the make up of their region:

> "I suppose the counties that make up the Midlands region were the ones that no-one else wanted"
>
> Interview with Enterprise Ireland Representative (August, 2002)

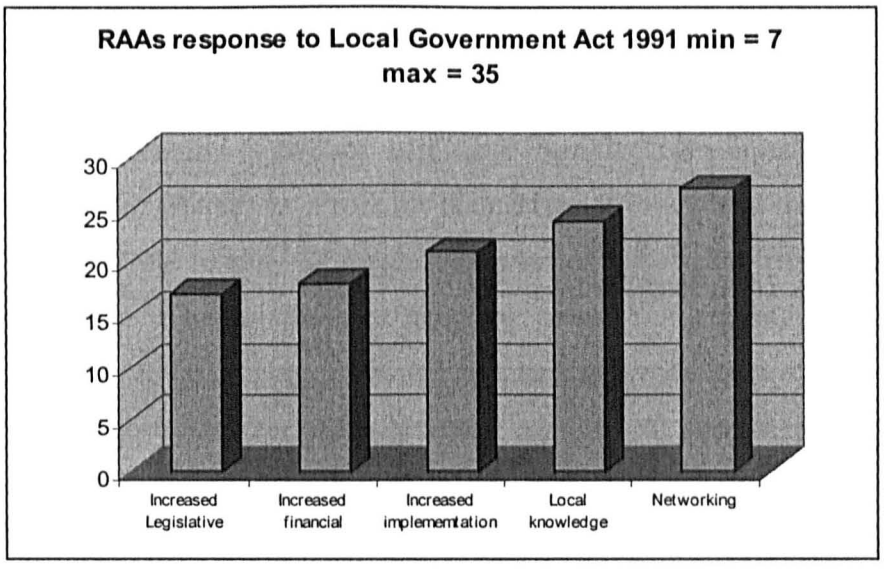
In dividing the country into regions it would be hard to please everyone, but with regards economic functions and the hinterlands of the country's major cities, most of the Regional Authority Areas of the 1991 Act did make sense. However as we will see below the two regions that lacked coherency are also the two poorest regions in Ireland, both lacking the presence of significant urban areas.

In theory the Local Government Act was demonstrative of bringing the power down to the local level. It was an attempt to look at Ireland as a conglomeration of regions rather than one unitary state of centralised power. It is part of the recognition and growing awareness that the impacts of increasing levels of competition between regions and how global - local interplays have had very different impact on the Irish regions. The Act also heralded the start of an increasing amount of emphasis being put on knowledge and learning and especially on the development of linkages

between local actors. The role envisaged for the Regional Authorities were to act as animateurs of interaction. They were to act on the local level as a public institution aware of the needs of the private actors in the region, to work with them and help them work with others (McCafferty and Walsh, 1997).

From survey material, each of the regional authorities were asked to rank those areas where the Local Government Act had affected their region. The results indicate that the Act had very little impact on increasing the autonomy of the regions, with virtually no increase (from an already miniscule base) in financial, legislative or implementation autonomy. It did have a positive impact on the increased use of local knowledge, and even more of an impact on increasing the amount of networking of regional actors, the Act as a decree of handing power down to the regions was virtually ineffectual. Indeed, talking to the directors of the Regional Authorities there is a perceptible air of frustration regarding the lack of autonomy they have as elected representatives. When asked to rate on a scale of one to five (five being the highest and one the lowest) whether they thought Regional Authorities had enough autonomy the answer averaged at just over 1.5 (see figure 7.1).

Figure 7.1 Response to the Local Government Act



Source: Survey Material (With respondents asked to rank from highest to lowest, 1 to 5 the aggregate minimum of the seven respondents was therefore seven.)

However, judging from the list of quotes below, from interviews with the Directors of these authorities which took place in summer 2002, it becomes obvious that they see themselves as one of the major actors in each region. They also place a great deal of emphasis on their work with the private sector and as co-ordinators of networking amongst regions. What is of note here is that talk of 'demand-led' approaches are not solely the domain of RISI regions in Ireland, but in fact can be seen as the approach adopted all regional authorities:

> "Our brief is huge - we have 18 people working here on many different areas to develop the region. Our target is to increase the overall social and economic sustainability of the region" Southwest RA

> "We are shouting out to the companies up in Dublin to come down here and set up" Western RA

> "It is a case of putting the region across in the best light and our focus is on the development of knowledge based industries - especially indigenous ones" Midlands RA

> "We try to get the region's main actors working together for the betterment of the region... ours is a bottom-up approach" Midwest RA

Although lacking in any real autonomy from the Government in Dublin, the Regional Authorities (RAs) saw a role for themselves, a role which during the 1990s was seen as a key role to play in the development of the region. But there will always be a difference in what role you perceive yourself as playing and what role you are perceived to be playing. Referring to interviews with other actors in the same regions, what follows is a list of quotes from members of private industry (both indigenous and foreign) and members of States agencies including a quote from a TD[1]. I questioned all interviewees on how they perceived the work of their Regional Authorities, the following are a sample of the responses:[2]

[1] TD refers to Teacht Dáil, the Dáil being the Irish Parliament and a TD being a member of it.
[2] It should be noted at this stage that responses vary across different regions, but that shall be dealt with in the following chapter.

"Never heard of them" MD Sybernet

"The who?" ADC International

"That shower...." City Manager in Galway

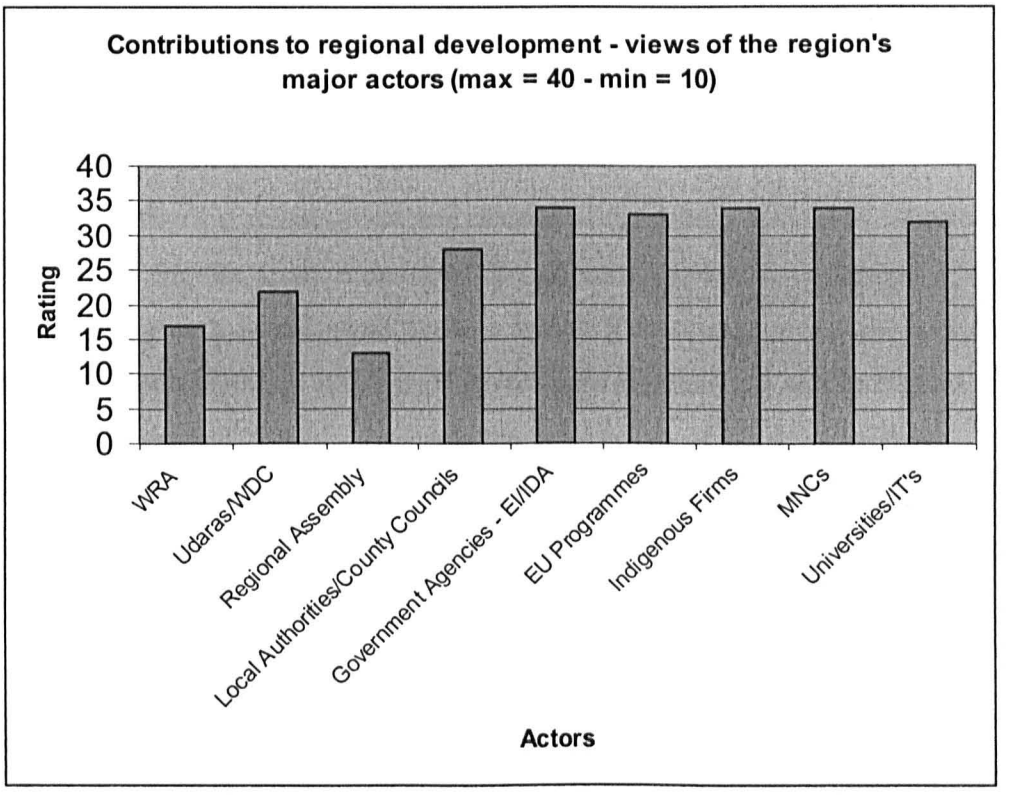
"I think I met them once" Dell representative

"Between the Regional Authorities and the Regional Assemblies, with the WDC and Shannon Development and Údaras - there is too much talk and not enough action" Representative of Enterprise Ireland

"With all these different levels from local to regional to national the planning industry in the only growth industry left in Ireland" Michael Ring TD

Figure 7.2 shows survey results of a broader spectrum of actors at the regional level and ranks the regional authority close to the bottom in terms of importance in planning and assisting the region's development

Figure 7.2 Contributions to Regional Development (West Region)



This example from the Western Regional Authority (WRA) Area provides some interesting results that are in part reflected across the whole country. Most obvious is the perceived importance of indigenous companies, multinational companies and State agencies (such as the IDA and Enterprise Ireland). Behind these are third level institutes and EU Structural Funds. It is worth noting the relative weights then put on authorities and how this accords to their respective scale. The most notable trend is that the more local the authority and the smaller their scalar scope the more important they are seen to be. This is played out by the fact that the Regional Assembly (in this case accounting for the Border, Midland and Western Regions) is regarded as having little or no importance, the Regional Authority Areas (the Western RA) is seen as having a little more, but generally of little importance. The local authority (in this case Galway county council) is considered nearly twice as important as the previous two.

Having looked at the evolution of regional development policies and their impacts over the 40 years from the 1950s to the 1990s, the next section seeks to further probe

their influence by looking at the fortunes of Irish regions over the same period in time[3].

Regional Fortunes

In chapter five I discussed how the decade of the 1990s proved to be something of a golden era for the Irish economy. The country experienced unparalleled levels of economic growth at the same time as which it saw unemployment levels plummet, inflation levels stabilise and inward investment increase at a substantial rate. Table 5.1 used GDP growth rates to illustrate the emergence of the 'Celtic Tiger', which saw the rapid transformation of the Irish economy from one with a per capita GDP of just 63% of the EU average in 1987, to one which actually exceeded the average ten years later rising to 121% in 2000.

National statistics for Ireland paint a very positive picture of the country. While all eight regions did record a healthy increase in GVA[4] over the 1990s the benefits do not appear evenly spread. Speaking in absolute numbers, Dublin and the Southwest faired the best, with increases of 12 and 5 billion pounds[5] respectively. The case for a widening income gap between regions is lent credence by the above figures in tandem with the fact that those registering the lowest increases in absolute terms were the Midlands, Border and West regions.

This trend can be seen again when we take a look at percentage shares of GVA across the Irish regions (see table 7.1). In 1993, the Dublin region accounted for 38% of the total GVA in Ireland, after 1995 this figure has showed a steady increase to 39.6%. In the Mideast region the rise has been even more dramatic. In 1993, the region accounted for 6.3% of national GVA, by 1999 this had increased to 9%. The only other region to increase its share of the national pie was Southwest region. The remaining five regions saw their national shares decrease. The most dramatic of these were in the Border and Southeast regions. The former experienced a drop from 9.2%

[3] For ease of interpretation, when reference is made to Irish regions it is according to the delineation set out in the 1991 Local Government Act (see Map 7.2).
[4] Gross Value Added at basic process is a measure of goods and services produced in a region priced at the value which the producers receive minus any taxes payable and plus all subsidies as a consequence of their production or sale
[5] Pound here (£) is Irish punts = €1.27

of the national GVA in 1994 to 8.3% in 1999. For the latter the fall was even steeper, from 10% in 1993 to 8.3% in 1999.

The 1970s Taoiseach, Mr. Jack Lynch was renowned for his use of phrases and allegories. He famously asked the Irish people not to look for a bigger share of the national pie, but instead to increase the size of the pie for everyone's benefit. So while Ireland was increasing the size of the pie, it becomes obvious that some regions were increasing their share of it.

Table 7.1 % of GVA – v - % Population Irish regions 1998 and 1999

Regions	*%GVA 1993*	*%Population 1993*	*%GVA 1999*	*%Population 1999*
Border	9.2	11.3	8.3	11.0
Midlands	4.2	5.7	3.8	5.6
West	7.3	9.7	7.1	9.8
Dublin	38.8	29	39.0	29.3
Mid East	6.3	9.4	9.0	10.1
Mid West	7.9	8.8	7.8	8.7
South East	10	10.9	8.5	10.7
South West	16.3	15.1	16.8	14.8

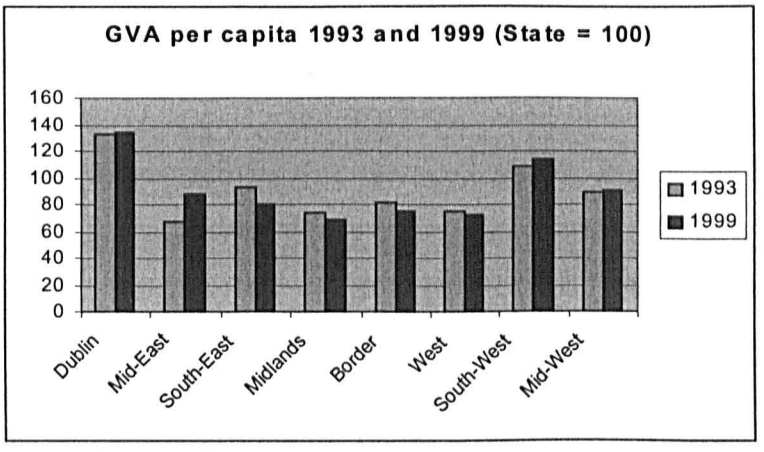
Source: CSO 1996, 2001

Table 7.1 shows the population and GVA share across regions. From this simple table the trend already highlighted again becomes obvious. As a rough measure we can say that the higher the population and the lower the GVA, the poorer the region and the people within it. Using this measure, we see that the problem of divergence of regional economic performance (in the sense of their share of GVA) is becoming more evident in the state. In the Border, Midlands, West and Southeast regions, the negative gap between their share of population has widened over the decade of the 1990s. Their share of population relative to GVA is on the increase, while in the remaining regions the opposite is the case.

Pictorial evidence of what is laid out in the above table is given in figure 7.3 below. GVA per capita is mapped out for the years 1993 and 1999. The difference is stark. The usual suspects arise again, with the Border, Midlands, West and South East regions all finding themselves in a relatively worse position compared to the national

average over the boom years of the Celtic Tiger. At the same time we see Dublin, Mideast, South West and Midwest all registering an increase relative to the national average over the 1993-1999 period.

Figure 7.3 GVA per capita 1993 and 1999 (State = 100)



Source: CSO; csfinfo.com

In Chapter five and figure 5.3 in particular I have shown how national GVA statistics are broken down by sector. 1990s Ireland displays trends of a newly developing economy through the steady rise of both the industry and services sector and the analogous decrease in the agricultural sector over the time period. The sectoral breakdown of GVA, however, differs from region to region. These differences are also rather predictable, with Ireland's less favoured regions displaying a marked dependence on lower value added sectors such as agriculture and basic industry. One of the easiest ways to see this is by examining productivity figures for each of the eight regions.

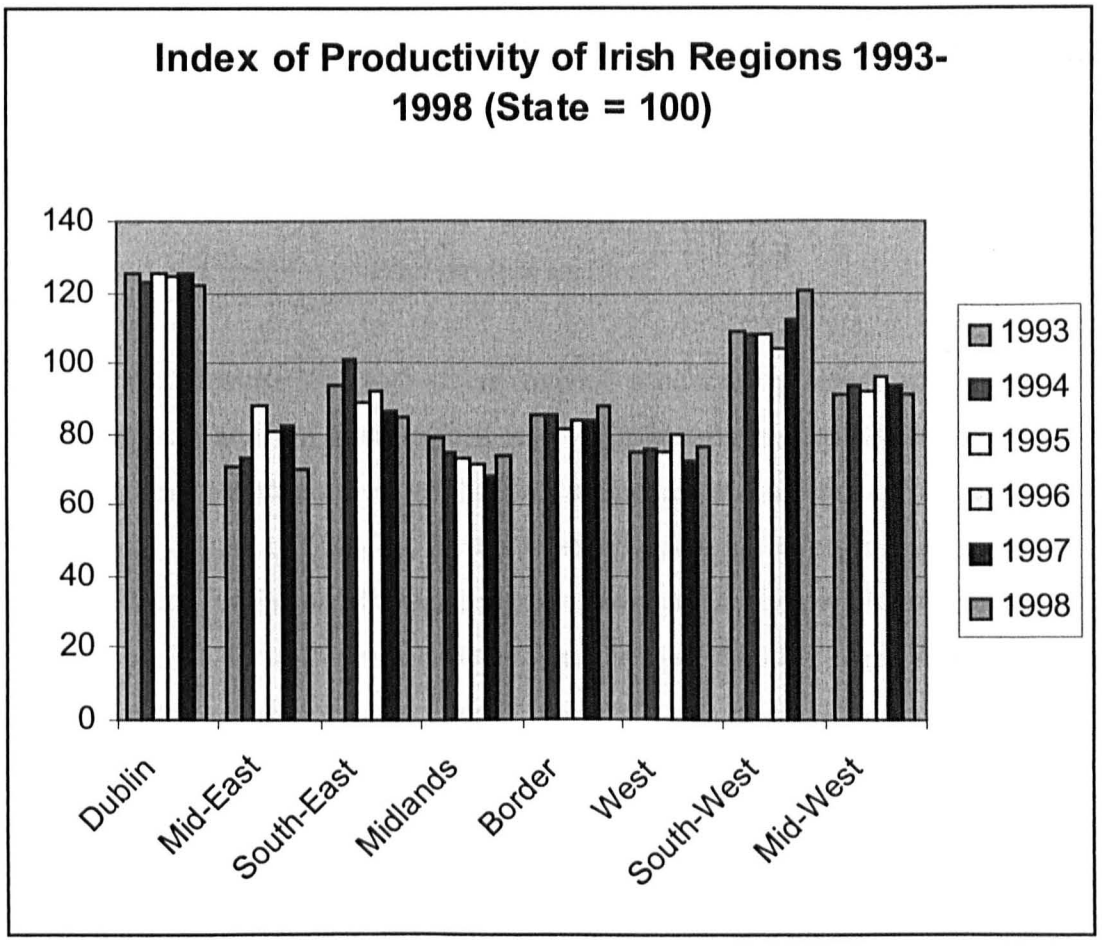
Table 7.2 Productivity by sector in Ireland (1993-1998) (Total GVA per employee) (IR£)

Sector	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*
Agriculture	14,716	13,791	14,438	14,444	13,406	19,303
Industry	36,860	39,076	44,423	47,364	51,697	49,060
Services	23,345	24,425	25,529	26,941	29,695	33,089
Total	26,078	27,330	29,517	31,372	34,652	36,217

Source: CSO, 1996, 2001

Table 7.2 shows that overall productivity in Ireland increased substantially over the period shown for each sector. The least productive sector, where output per worker was less than the other two sectors was agriculture. This sector actually registered a decrease in productivity for the year 1993/94 and again for 1996/1997. However, the following year the sector sees a (rather inexplicable) leap in productivity. The service sector rose consistently over the period shown, and by 1998 had a GVA per employee of £33,089 compared to £23,345 five years earlier. This is evidence of a significant increase in productivity over the years shown. But by far the most productive sector over the period is the industry sector, which has a GVA per employee on average two to three times the size of agriculture and 1.5 to twice that of services. The high productivity of particular subsectors of industry will account for a certain extent of this, but one major reason offered by O'Hagan (1996) is the high-value added nature of Irish high-tech manufacturing. (See section on software)

Figure 7.4 Regional Productivity



Source: CSO, 1996, 2001

Figure 7.4 shows an index of productivity for all the Irish regions. Not surprisingly the two regions with greater than national average performance are Dublin and the Southwest. Between these two it is worth noting their respective trends over the time period, while the Southwest is showing marked increases in productivity, Dublin has shown somewhat of a decrease. The performance of the Mideast region is also worth mentioning in terms of its under-performance. Several factors could help explain its high level of GVA and its low level of productivity, not least of these are the fact that a significant amount of residents in the region are commuters to Dublin, thus lending more to the productivity of that region than to the one in which they are resident (Sweeney, 2000). For 1998, this region measured the lowest productivity of all regions. The only other region to reach the state average apart from Dublin and the Southwest, was the Southeast, in 1994 it crept over the average before falling 15 points over the following four years. The least productive regions are again the Border, Midlands and West.

The above figures and analysis broadly confirm the trends identified by Boyle et al (1999) in their study of regional equalisation in Ireland over the earlier time period of 1991 to 1995. Their data on the decomposition of regional variation in GVA per worker (Log (region/state) x 100) into 'within' and 'between' sector effects suggests that for the most part inter-regional variations in productivity are explained by the industry and to a lesser extent the services sectors.

> "In the industrial sector, where overall productivity levels are highest, the Southwest and the East regions have significantly higher levels reflecting the very high concentration of high-value added manufacturing sectors around Dublin city and Cork city. By contrast, productivity levels in manufacturing in the West, Border and Midland regions are particularly low. As regards services there is a clear difference between the East and all other regions. The East has by far the highest regional concentration of services employment. Furthermore, between 1991 and 1996 almost all of the increase in GVA per worker came from industry and services activities that are generally located in urban areas" (Boyle et al, 1999: 174).

Regional Divergence

When we look at performance on the regional level a stark reality becomes clear. At the same time as Ireland moves up the international table in terms of economic performance, we see increased polarisation of its constituent regions. By contrast during the years of economic stagnation, from the 1960s through to the 1980s, the constituent regions of Ireland converged in terms of their economic performance. It is now becoming obvious that the emphasis on inward-investment industrial policy during the last two decades, which has bought strong national economic performance, has coincided with diverging Irish regional standards.

The recent surge in inward investment differs greatly from that which went before. Whereas foreign investment in the 1960s and 1970s was mainly focused on low-skill assembly with better regional spread, more recent investments have involved higher levels of involvement in information and communication technologies (hardware and

software). Associated with this shift has been a very high level of concentration of recent investment in main urban centres, especially Dublin, whereas, earlier, foreign investment had tended to avoid these centres, choosing instead to locate in smaller towns, thereby giving rise to a highly dispersed pattern of branch-plant distribution (Breathnach, 1982). Earlier locational patterns were influenced by the dispersal policies pursued by the government, who offered greater subsidies for firms to locate in more rural areas. The nature of these earlier types of manufacturing was also conducive to location in these areas, because of the cheaper labour and the low-value added nature of these production techniques.

Table 7.3 presents evidence on the level of living standards (measured in Gross Value Added) convergence and the ratios of regional to national average living standards (of 100) over a thirty-eight year period. In 1960 there was a high degree of dispersion present with the most prosperous Dublin/Mid East region enjoying a level of living standards 2.3 times that of the West. The high degree of dispersion is evident in the coefficient of variation at 31%. By 1979, the overall level of dispersion decreased significantly to just under 16%, with Dublin/Mid East dropping 37% relative to the average and the poorer regions all gaining. In 1996 the level of dispersion increased to over 18%. The richer Dublin/Mid East and Southwest regions pulled away from the average, while the poorer regions all failed to continue to converge, with the Border actually loosing ground (O'Leary, 2001).

Table 7.3 Degree of living standards convergence among 7 regions: 1960, 1979, 1996 and 1998 measured in GNP, National average = 100

Regions	**1960**	**1979**	**1996**	**1998***
Border	81	89	82	*82*
Dublin / Mid East	167	130	135	*136*
Midlands	88	85	85	*81*
Mid West	94	102	105	*104*
South East	95	103	104	*94*
South West	102	104	107	*110*
West	74	87	86	*82*
Level of convergence	31.0	15.8	18.4	*20.16*

Source: O'Leary (2001:9)

* Estimates from more recent census data using O'Leary's method.

O'Leary's results are broadly consistent with those of more recent Irish studies. O'Connor found that personal income per capita converged at a rate of 1.2% per annum between 1960 and 1977, with all the convergence occurring in the 1970s, while between 1979 and 1996, gross value added (GVA) per capita diverged by 2.5% per annum (1999). The use of consistent measures leads to the result that convergence of living standards among Irish regions was relatively strong during the 1960s and 1970s. However, this convergence appears to have been displaced by divergence over the last two decades. Of note is the fact that this performance is in stark contrast to the convergence to the EU level of Ireland as a whole. Relative to the EU average, Irish GNP per capita diverged during the earlier period but converged strongly in the last two decades. Looking at the figures for 1998, we see the level of divergence increasing dramatically vis-à-vis the figure for two years earlier. This is of note, because when we look at the same time period on table 5.1, we see that this was the crux of growth in national figures. This is cause for concern for policy makers.

Regional divergence and regional policy: evidence from regional actors?

Regional divergence in the Celtic Tiger is strongly recognised by all the regional authorities in Ireland. According to survey results for this thesis, all agree that the differences in regional economic welfare have been on the increase over the past 15 years, with over two thirds strongly agreeing. It comes as no surprise that those who tend to strongly agree are those who have benefited less from the age of economic prosperity. When asked to compare their regional growth to that of the national growth rates, Dublin, Mideast, Southwest and Midwest regions all ranked their score as being well above the national average - the remainder considered themselves to be much further behind. Indeed it could be suggested that there is a degree of despondency amongst the less well off regions:

> "Well you have to look at it like this, there are big differences and there will always be big differences when you look at the amount of money going into the

Dublin area, its absolutely huge. They argue that that is where the real problems are, at least that's what we're being told!"

Director Western Regional Authority (Interview May, 2002)

"In Mayo we cannot actually get another large company to set up there, not because they wouldn't but because they couldn't, the electricity supply could not handle it. For these reasons there is no way you could compare us to the Dublin and Cork regions"

IBEC representative - West Region (Interview July, 2002)

"All this talk of a Celtic Tiger a few years ago, well you go around to some of the towns in this region and they will tell you that the Celtic Tiger wouldn't even have taken a shit in this place, much less stopped off here"

County Councillor - Midlands Region (Interview, August, 2002)

The most common reasons cited for failure to equate to the national average are:

- Lack of key infrastructure
- Lack of a University
- Lack of significant urban area
- Overly dependent on agriculture

The Border, Midlands and Southeast regions share all the above characteristics in common, with the consensus view that each region lacks a specific area of critical mass. These are the regions (excluding the Mideast) that lack a city.

On the other side, the regions that consider themselves to have benefited from the boom years of the Celtic Tiger cite the following reasons:

- The presence of a multinational sector
- Good partnerships between actors
- Good infrastructure
- Decreased dependence on agriculture

The divide is clear, it is a case of the 'haves' and the 'have nots' between the Irish regions. A multinational sector will only grow in an area with a critical mass of

knowledge/employees/services. Partnerships grow best with a diffuse number of actors such as Universities, MNCs and Regional development agencies. Essentially what is being played out in Ireland is a case of economies of scale, with all the benefits accruing to the richer regions.

As we have seen in the preceding chapters Ireland has very much embraced policies promoting the establishment of multinational companies, which have accounted for a significant percentage of the increase in the country's economic fortunes. Opinions on this policy approach are closely linked to those of patterns of spatial development. A schism exists in the Irish development arena between those in favour of a more concentrated, clustering type development and those favouring a more diffuse type of development. The opinions of the main actors in this policy circle are very much influenced both by agency and place. As the following quotes show, those concerned with bringing in foreign investors (e.g. the IDA) have a much different idea about a developmental trajectory to those concerned with indigenous growth (e.g. Enterprise Ireland). At the same time the opinions of those based in smaller towns differ from those based in larger towns and cities, but this can be voiced by people within the same organisations:

> "Our approach is clearly a small towns matter, in our report 'Blueprint - invest in the West' we focused on FDI...we clearly set out in the document 22 towns that we felt should be targeted"
>
> Carissa Lynch WDC - based in a small town (Interview July, 2002)

> "We have the ideal clustering effect here in Cork city... we are aware of the talk of diffuse development and the idea of asking people to come to Ireland and set up in some bog, well that is just aspirational - a lot of damage will come from such expectations"
>
> IDA Representative - Cork City (Interview September, 2002)

> "It's a case of horses for courses really, we target specific operations for specific places so that small towns like these can develop"
>
> IDA Representative - Ennis Town (Interview July, 2002)

"There is no doubt that there is a regional dilemma ongoing at the moment in the west - we have to be very conscious that companies are evenly spread and are at the parish-pump"

EI Representative - Galway County (Interview May, 2002)

"Lets be realistic, it's not a case that every place will have a buoyant industrial sector, decentralisation is more a civil service... you can't expect booming companies to set up at every parish pump"

EI Representative - Athlone (Interview, August, 2002)

"What we can do is get them here to Galway and hope that the surrounding area receives a trickle-down effect"

IDA Representative - Galway City (Interview May, 2002)

The above statements clearly depict the differences in opinions amongst the State's development actors. This is reflected in theory as has been described earlier, as the present policy speak abounds with words and phrases such as local/regional and 'bottom-up'. Many state agents employ these terms, but at the same time there exists an almost bitter sense of reality in the acceptance by others that development is essentially a top-down phenomenon, trickling down from the major urban areas to the towns and villages in their hinterland.

This dichotomy can be seen in a slightly different light when development actors across the study regions were asked whether the results of their work (such as advising businesses to locate in certain places, subsidising rent of certain companies etc) in terms of growth in their region was simply a result of plain economics and the power of the market forces which would have occurred in absence of their developmental attempts. The answers on the whole were, quite predictably defensive if not somewhat vague.

"No, no you can't say it's all down to the market, we create a more favourable environment for firms to come here, there is infrastructure provision for one thing, and we have something to do with that."

Western Regional Authority Director (Interview May, 2002)

"I think that there has been a good regional policy put forth by the IDA and Enterprise Ireland, there are strategies in existence that are there and that in itself is something"

EI - Western Region (Interview May, 2002)

What has become clear from the above analysis is the promotion of the local level, bottom-up approach by regional actors in the face of the top-down policies pursued at the national level. This proves very interesting to my work owing to the fact that at the outset my methodological approach to regional development in Ireland involved comparing my two case study regions (Midwest and Southwest) with two other Irish regions (Midlands and West). The rationale behind this was to compare 'policy-on' versus 'policy-off' regions. The Midwest and Southwest, through RISI, were seen as promoting a demand-led approach, while the other set of regions were seen to follow the national lead of inward-investment oriented supply-led policies. Comparing the two sets of regions would enable a better appreciation of the two approaches pursued in each. However, as we have seen, with regards the use of terminology and/or policies pursued, there is little difference between the two.

Companies interviewed in the software sector did not seem to have as straightforward a view. In terms of locational decisions the rationale for setting up in certain places are not as straightforward as theory or policy makers would claim. Over half the indigenous firms interviewed cited personal reasons as the number one priority in terms of where they set up.

"We wouldn't be anywhere else... this is where I grew up and I want my kids to grow up"

MD Vistech - Cork (Interview August, 2002)

"You get these questionnaires all the time asking if you looked at the price of telecoms infrastructure where you set up...but that matters little if your wife and kids want to stay where they are"

MD Parthus Tech - Galway (Interview May, 2002)

Most indigenous companies agreed they preferred to be outside Dublin because of the diseconomies associated with congestion. However, when asked which development actor if any was instrumental in their setting up, all but one said that they had little or no dealings with any local/regional actor (the exception being Shannon Development) and over three-quarters envied the attention given to MNCs by the State. Only companies in the Midwest and Southwest regions paid positive tribute to their regional authority.

Locational decisions of MNCs seem to be equally less than clear. All companies interviewed were in the regions outside Dublin; Dell and Tellabs made a clear decision to locate in the National Technology Park, citing reasons such as a highly trained workforce, excellent telecoms infrastructure and a milieu effect. Cork city's major actors cite the additional incentives from the State to locate outside of Dublin City. In Galway a representative of a MNC carried on from the others but in a more blasé tone:

Q. How do you find being a technology company in Ireland?
A. We came to Ireland and looked at sites in Galway, Limerick and Cork – we decided to go with Galway because that is the one that the MD liked the most.

Q. How is it being a software company in the west region of Ireland?
A. No different from anywhere else in Ireland – the low tax rates are on a national level so the difference between regions would not be much (incentive wise). We give out about the roads, the rail and the airport – but so does everyone else – to what avail?

Q. What are the particular locational advantages to the West?
A. That doesn't really apply, we simply liked the look of Galway and that was that, aesthetically it is very pleasing – the business park was nice and we were put in with other MNCs and indigenous firms.

ADC International Ltd.

Incentives in terms of non-market, state incentives have been cited by all companies as a good reason to set up where they did. What is most disturbing for the regional development actors is the fact that these only seem to matter on the national level and very little on the regional. Irish companies set up in Ireland, for the most part as close as they can to home, foreign companies set up in Ireland, for the most part anywhere with a significant 'critical mass' and sufficient telecoms infrastructure. It is hard to decipher the effects of regional policy when the reality is one of locational decisions dominated by personal or market reasons with locational packages of different regions making little impact.

The Case of Broadband: Telecommunications infrastructure in Ireland.

"How we communicate, are entertained, organise our lives, and access services is driven nowadays by developments in ICTs and we are increasingly referring to this as the Information Society. One of the key attributes of ICTs is that they can make space and distance irrelevant. Whether we access the internet in Tokyo, Dublin or Bellmullet, the information will be the same and, in theory, the potential for communication unlimited by location." (Department of Enterprise, Broadband in Rollout in Ireland 2002; p. i)

This rather positive start to the Government report on Broadband (BB) infrastructure in Ireland belies the reality of a country in which the rollout of BB capabilities is unequal and, as is being increasingly realised, a main contributor to Ireland's rising regional disparities. As information and knowledge are key drivers of modern industrial growth, therefore the availability of modern telecommunications is essential (while also underpinning the development of e-Government and e-Learning). The availability of quality telecommunications infrastructure and services at a competitive price is as crucial to regional development in Ireland today as rural electrification was in the 1940s and 1950s. It is very much a spatial issue – access to, cost and quality of services in Ireland is very much related to location suggesting an emerging 'digital divide' or 'BB gap'.

The *Chamber SME E-Business Survey 2002* data on internet usage and connectivity suggests considerable regional variation. Within the SME sector, Sligo and Ballina have a higher dependence on PTSN and ISDN (see appendix for explanation of terms) lines, than either Galway or Limerick. The former also have a lower internet penetration rate (74%), compared to either Galway (89%) or Limerick (93%) (see Chapter 8).

Table 7.4 General Access to the Internet in Sligo/Ballina, Galway and Limerick

	Standard phone %	*ISDN %*	*Leased Line %*	*Cable %*
Sligo/Ballina	42	54	4	0
Galway	35	49	13	1
Limerick	29	45	16	3

Source: Chamber Survey

Other surveys (ODTR, the Commission for Communications Regulation) have identified significant user-demand for additional capacity. Approximately 45% of businesses nationally believe they will need additional BB access within the next year. In Connaught/Ulster 38% of SMEs reported that lack of BB access was a constraining factor for their business (ODTR, 2002). Those working with foreign owned MNCs point to two key requirements:

1. BB availability
2. A plurality of providers to provide a competitive environment

Government policy has been to position Ireland as an e-commerce hub with the telecommunications infrastructure capacity to compete for FDI. Despite this, in 2001 Ireland was ranked 27th out of 30 OECD countries in terms of BB access, availability and use (OECD, 2001)

The State of the West (WDC 2001) analysed the rollout of telecommunications infrastructure in the West – and the implications of liberalisation of the sector:

> "as the deregulation process is evolving, rollout is proceeding in areas with high-density business and residential usage. It is the free market that is largely determining supply and provision. If free market principles continue to determine rollout, then much of the Western Region will have extremely limited provision and capacity" (p.114)

As has become obvious the question of BB infrastructure is on the mind of most public and private actors in the regions of Ireland. From Maps 7.3 and 7.4 we see a distinct geography behind telecoms provision. Prior to liberalisation the only provider

was the semi-state owned Telecom Eireann (now Eircom). As a result of their monopoly market share Eircom's (termed the 'incumbent') network is the most significant and pervasive. In 2002, the network consists of over 200,000 km of fibre extending from Dublin to the regions. The backbone exists but there are parts of counties Mayo, Galway, Clare, Kerry, Cork with significant distances from the backbone. Additionally parts of the route are composed of copper which can only transmit 2Mb. Interestingly, an Eircom representative in Dublin claimed:

> "Over 90 percent of the demand is for services at 2Mb or less – these can be delivered more adequately over the copper networks."
>
> Interview September, 2002

However the reality is that in the regions, the network does not have sufficient capacity to attract new FDI, particularly those companies in the ICT sector. Also the view is short sighted in failing to recognise that future demand will require greater capacity at a competitive price. Just as a road network to a town is required before it can be developed, similarly telecommunications infrastructure is required before BB can be delivered.

At the national level there is also a great deal of awareness of the problem posed by Broadband and the lack of its capacity. National newspapers, such as the Irish Independent frequently run headlines highlighting Ireland's problems with broadband (BB), such as "Ireland ranks 51st out of 73 States in terms of broadband" (Irish Independent, 19th September, 2003). This referred to a study by the International Telecommunication Infrastructure which ranked the Republic behind everyone of its EU counterparts excluding Greece and also behind less developed countries such as Peru and Slovenia.

It is a problem recognised by national actors also, this is obvious from the government proposals of 'Bringing Broadband to the regions'. The Minister for Communications claims that the plan "..sends out a very clear message that the government is embracing fast, cheap internet access" (New Connections, 2002). Brendan Butler, director of ICT Ireland maintained that the telecoms infrastructure in the regions of the country is in most need of attention:

"Although the quality and cost of communications from say, Dublin and New York is first class, the cost of calls from within Ireland to Dublin or internationally leaves a lot to be desired"

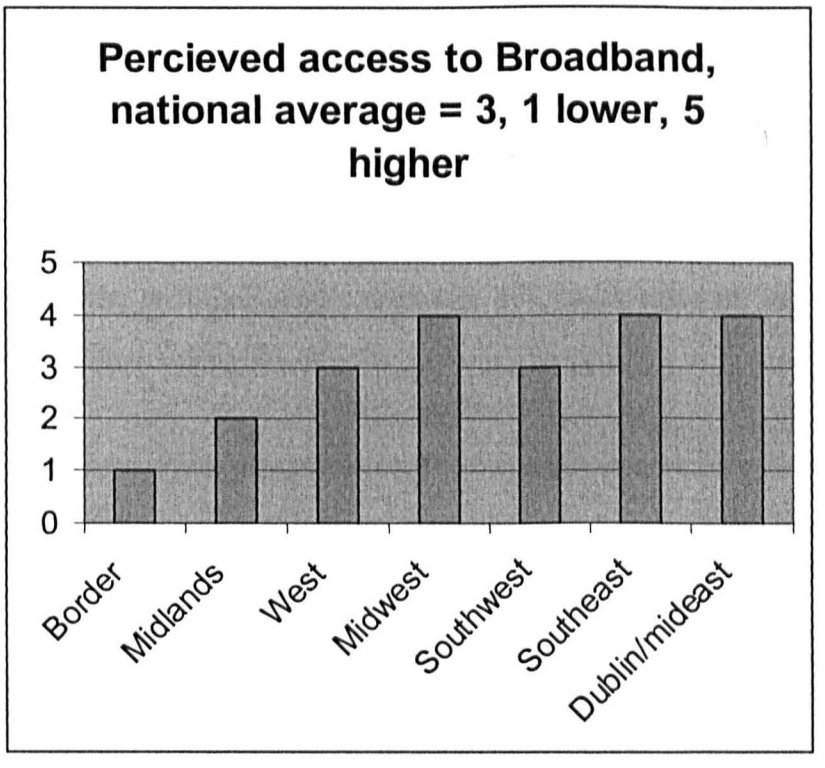
Interview May, 2002

"we know from our clients that broadband availability is without doubt contributing further to the geographic imbalance in Ireland. We ask guys to move out of Dublin and they say fair enough, if we guarantee the infrastructure they might!"

Representative National Informatics Directorate (Interview, December, 2002)

In terms of the case study regions, analysis of work highlights the problem and the geography behind it. Making use of results from regional surveys in Ireland, figure 7.5 demonstrates the degree of difference in how people perceive their access to BB.

Figure 7.5 Views from the Regional Authorities



Source: Survey material

When RAAs were questioned about their regions access to BB, the results show a great deal of disparity between them. The less favoured regions of Border and Midlands see themselves as below the national average, while the southeast and east see themselves above it. There is an east-west divide with the exception of the Midwest region. A second divide is also evident from within the case study regions. Looking at the following quotes we see two examples of technology companies in the Midwest and Southwest regions:

The first set of quotes comes from an interview with the Director of Research in Piercom Ltd. an indigenous technology firm situated in the National Technology Park on the outskirts of Limerick city (Midwest region), and a representative of the MNC, Dell located close by:

"Q. Do you have any problems in terms of telecoms infrastructure?
A. None at all, we are connected to the fibre optic ring in the Park, and if we need to increase the capacity of usage the option is there for us to do it."

"Nope, probably one of the attractive features of the Park"

Moving towards the Southwest region, we see that a similarly positive outlook, this time with a note of caution. The first quote is from the MD of Vistech Ltd, situated in the National Software Centre in Cork, the second is from a representative of Motorola, an MNC employing over 500 in its software development centre on the outskirts of Cork city:

"Q. Do you have any problems in terms of telecoms infrastructure?
"The telecoms here is fine, we have basically all we could ask for"

"I cannot really say that we have a problem with the infrastructure, more a problem with the price. I know we have a similar operation in Germany, where telecoms costs are a fraction of ours. You can get better value at home in Germany than in business here!"

The issue of the costs of broadband provision appears in one of the two RISI regions, but not to the same degree as it does in the other two case study regions. What is most evident in the complaints about BB is not solely the presence of the means to supply but the price of provision and lack of competition in the telecoms sector. This is supported by the following quotes from the West and Midlands regions.

An example from a small technology company in Athlone

> "It's farcical really, we are meant to be living in the post-liberalisation age, where competition is rife to the stage that it benefits the consumer. Well not here, here your options are nearly as limited as they were under Telecom Eireann"

The difference in provision is made more clear by the IBEC representative for the West region:

> "Telecomms here, we have a significant gap versus the east coast, the greatest disadvantage is Mayo/Roscommon, in Galway you have got the infrastructure to a certain extent, but the main gripe here is with regards the cost differential. A company in Dublin city centre pays €10,000 to lease a 2Mbit line of BB, same company in Swords [outskirts of Dublin city] pays €14,000 and the same company in Galway pays €33,000."

ANU Internet Technologies in Galway City, is an internet services company employing eight people, moved from Westport to Galway city in 2002. According to the MD:

> "We would not have left Westport except for the weaker and more expensive telecoms capacity"

In Westport the company paid €33,000 per year for a 512kbit/s always-on connection. In Galway the company is paying €23,000 per year for a 1Mbit/s always-on connection. Therefore in Westport they were paying 30 percent extra for half the speed and capacity. In Galway, the company can benefit from the superior telecommunications infrastructure located there. There is some degree of competition in the Galway market. The national backbone networks of both Eircom and Esat extend into Galway. In Westport, there is only one provider. The backhaul distance from Galway to Dublin (and onwards to international connections) is less than that

from Westport to Dublin. Comparing the costs to other countries the company realised that in the US they can buy the same amount of bandwidth for €4,800 per year (costing €33,000 per year in Westport). In order to get around the excessive bandwidth costs in Ireland, the company moved 90 percent of their serving capacity to the US in 2000.

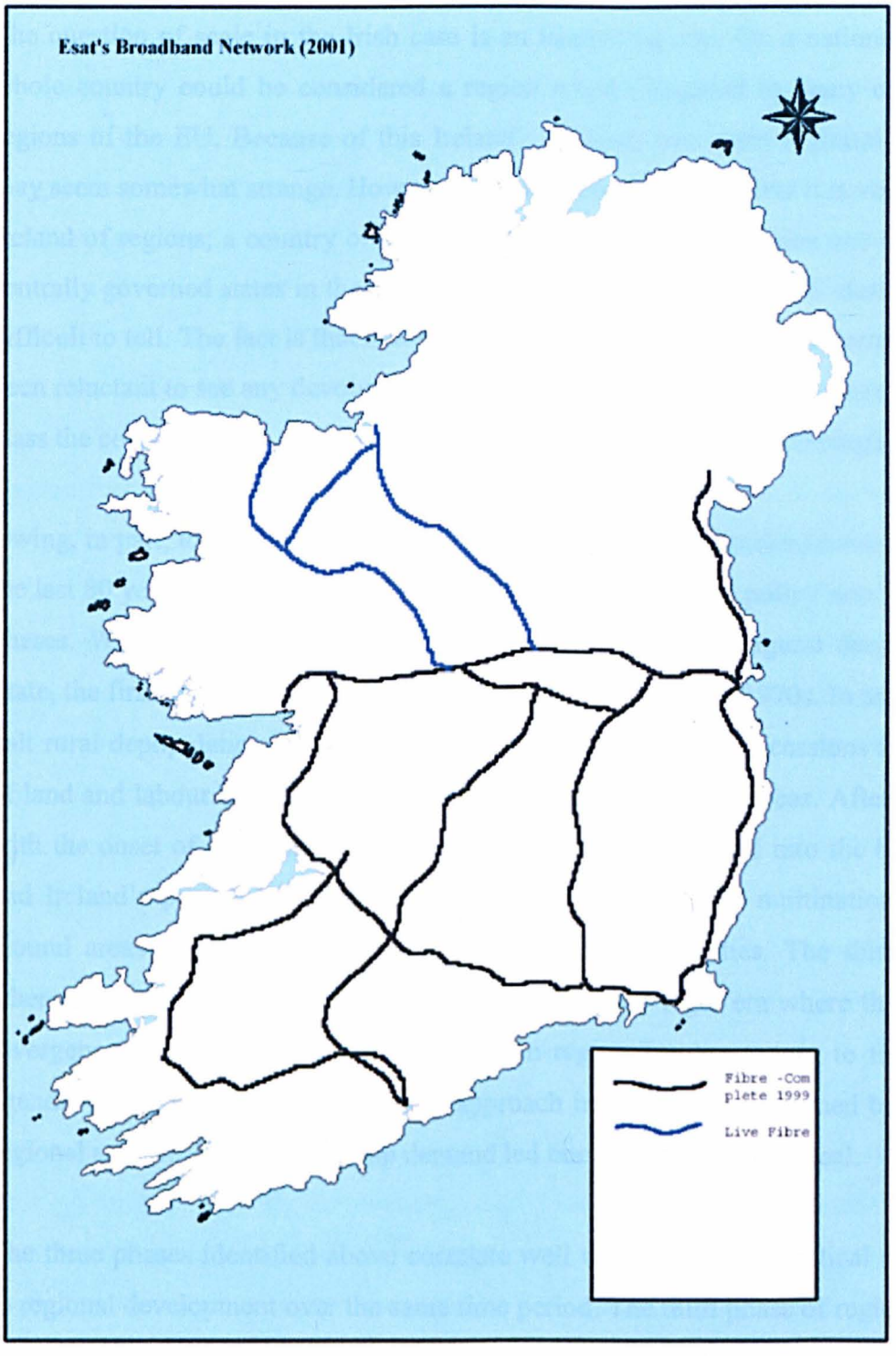
Examples such as this are evident across Ireland's less favoured regions. In terms of infrastructure small indigenous companies are suffering, and the reality is very far from the opening quote to Broadband Rollout in Ireland (2002). The idyll that underlies the ICT revolution might spur a company to set up in Ireland's less developed regions on the understanding that they will have access to the same information as those in Dublin and Tokyo. The reality is that the new space of the internet has become reconstituted within geometries of exclusion. The fact remains, that Ireland's Border, Midlands and Western regions remain excluded and are denied equal access, firstly in terms of basic infrastructure and secondly in terms of the costs to employ that infrastructure to access the information.

Another argument that comes out of the telecoms infrastructure is that of 'not trying to run before you walk'. The regional director of the IDA, Brendan Cloghessy made the following point: "If you were to lay down BB across the whole country tomorrow, it still would not make for balanced regional growth" (Interview, December 2002). There is a deal of recognition of this argument by the region's main actors. The MD of a software company in Galway city maintained that he "would much rather see them putting better air and rail facilities down than talk of BB" (Interview, August, 2002). Many of the companies interviewed (outside the Midwest region) complained of the loss of business because of the fact that they would lose a day travelling to any of the major cities in the EU, not to mention the US. While this may be, if Ireland is to continue reaping a competitive advantage from high-tech industries and the good name it earned over the 1990s, it must place its telecommunications infrastructure high on the development agenda.

Map 7.3 Telecommunications Infrastructure in Ireland (Incumbent)

Source: Eircom (2002)

Map 7.4 Esat BB Network



Source: WDC (2002)

Conclusion:

The question of scale in the Irish case is an interesting one. On a national scale the whole country could be considered a region when compared to many of the main regions of the EU. Because of this Ireland's division into eight regional authorities may seem somewhat strange. However, this chapter has proved that it is very much an Ireland of regions; a country of divided spaces. Yet, Ireland remains one of the most centrally governed states in the EU, how much of this is due to NUTS classification is difficult to tell. The fact is that since independence successive Irish governments have been reluctant to see any devolution of power as was demonstrated by its reluctance to class the country as two different objective regions in 2000 (see McDonagh, 2001).

Owing, in part, to this unitary nature Irish regional policy has lacked consistency over the last 80 years. In this chapter I have separated Irish regional policy into three broad phases. With regional policy virtually non-existent in the inaugural decades of the State, the first phase was the period between the 1950s and the 1970s. In an attempt to halt rural depopulation, the Government, through the use of concessions in the form of land and labour subsidies, promoted industries in peripheral areas. After the 1970s with the onset of economic liberalisation, regional policy faded into the background and Ireland's pursuit of inward investment saw much of the multinationals set up around areas of critical mass, primarily Ireland's major cities. The third phase is where Ireland finds itself at present, in the post-Celtic-Tiger era where the extent of divergence in regional performance has seen regional policy return to the political agenda. In its new guise, the regional approach in Ireland as confirmed by the eight regional authorities is a bottom-up demand led one, focusing on the local.

The three phases identified above correlate well with broader theoretical approaches to regional development over the same time period. The third phase of regional policy in Ireland is heavily influenced by the institutional perspective. While this is demonstrative of an institutional turn in Irish regional thinking, it somewhat contradicts my original agenda of comparing RISI and non-RISI region in Ireland.

In my alleged 'policy-off'/non-RISI regions of the West and Midlands, we see that the terminology being employed in each is very much steeped in the bottom-up approach,

under the influence of institutionalist theories. While this did put paid to a certain aspect of my research aims, it has also highlighted a very interesting and perhaps crucial point; policy adapts quickly to new theory. By the time I began to carry out my interviews in the two sets of regions, it became clear that membership of the Regional Information Society Initiative had little effect on whether the region's agencies/agendas were adept/soaked in the language of bottom-up, demand-led development on the local scale.

That said, while the language of the region's development actors may have been little different, the figures produced via O'Leary's (1999, 2001) convergence method show the gap between Ireland's regions in terms of economic growth is on the increase. Taking these figures in the context of the phases of regional policy, a much clearer picture begins to emerge. In the second phase of regional policy (1970s to 1990s) Ireland realised significant divergence in regional economic fortunes. This was a period of economic liberalisation in Ireland, which in the latter stages saw the Tigerish economic growth in Ireland as explained in chapter six. This period saw Ireland enter the Global economy, and the Global economy enter it. In the absence of any form of spatial regulation, we have seen global players come to Ireland and chose to set up their operations in the most economically attractive areas, Irish cities, while the less developed areas in Ireland remained exactly that. My interviews and surveys of regional and national actors show little surprise at the phenomenon. To say that there have been no attempts to address this problem would be an over-statement, but to say that no substantial attempts have been made would not.

This point may best be proved by looking at the recently published National Spatial Strategy in late 2002 (Department of the Environment). This long-awaited document recognises the biased and unbalanced nature of Ireland's economic growth. In many ways the document harkens a return to the days of Colin Buchanan and growth pole development. In 1969 Buchanan identified nine growth centres; a bold move at the time that never saw 'the light of day' in terms of policy implementation. The National Spatial Strategy (2002) has identified twice as many growth centres. An attempt to establish 18 growth centres in a country the size of Ireland could be interpreted as short-sighted local politics seeking a short-term solution. The NSS also lacks serious

finiteness and definition which is necessary in planning documents and any specific funding to implement it is absent.

"The rate of implementation will be subject to overall macroeconomic and budgetary conditions" (Pg. 17).

The NSS has suffered the same fate as many other regional policy documents in Ireland. It has fallen foul of the contradiction that is 'good economics rarely makes good politics'. Policy makers have again been forced to follow the will of the local over the good of the national.

What seems to be most clear from the study regions is the massive debate that is being played out in the minds and the actions of the policy makers and policy breakers. On the one hand there is local development and with that the concentration on indigenous industry with the goal of regional harmonisation and on the other those who promote clusters of development, encouraging foreign MNCs and talk of a trickle-down effect where eventually all regions will catch-up in the Bradfield/neo-classical sense of regional growth. There is a clear geography behind the debate and those who take different sides. It is not hard to see that those advocating the trickle-down effect are based in the major cities of Ireland, while those advocating the bottom-up approach are on the most part found in the upper and lower tier towns and villages of the country.

In terms of telecommunications infrastructure this too seems to confound Irish spatial problems. The evidence provided in this chapter shows that spatial development is no easier in the new industrial epoch than any that went before it. We have seen some examples of firms working out of rural areas, but we have seen more of firms being forced to move to more built up areas due to infrastructure provision and cost factors. Again the hope of uniform spatial development in Ireland is somewhat dashed by the workings of the free market, a market that will only bring competitive pricing to areas of high demand; Ireland's largest cities. Ideas of access and adaptability in the information age will be further investigated in the following two chapters, but the irony is not lost on the fact that one of the world's most high-tech economies has one of the world's worst provisions of telecoms infrastructure.

What both this chapter and the chapter before emphasise is firstly the myth of spatial equality in cyberspace and secondly a suspicion of the term 'glocalisation'. It is obvious that a great deal of the growth that Ireland has seen is a result of an increasingly globalised world, where production techniques and products themselves transcend national boundaries. At the same time, in Ireland we have seen a rise (albeit and relatively small one) in indigenous/local production. My analysis has found it hard to relate the two forms of development to each other; Ireland on the global level is very different to Ireland on the local level. This relates to the difficulty in creating a coherent regional policy in Ireland: on the one-hand we have an Ireland of Microsoft, Dell, etc located in the major cities, on the other hand we have a deal of indigenous software firms located outside the cities. A regional policy that will favour the two will have to focus on benefiting both.

CHAPTER 8: DEVELOPING THE REGION IN THE INFORMATION AGE

Introduction

The emergence of information and communication technologies (ICTs) such as the Internet, are said to herald the coming of the 'Information Society'. This is a new social and economic paradigm that is restructuring the traditional dimensions of the time and space within which we work and live. The global communication networks which make up cyberspace are claimed to be altering almost every facet of our lifestyles, including patterns of work and leisure, entertainment, consumption, education, political activity, family experience and community structures.

Often referred to as the arrival of a (global) information society, sometimes discussed as a 'weightless world' or a new network society, the change has been characterised as the arrival of the post industrial or service society (May, 2000; Touraine, (1974); Webster, (1995)). Pinning down a definition of the Information Society is an extremely difficult task, made less easy by its chaotic nature, to which several different meanings and uses are put, which are all too often compounded by hype and hyperbole. Regardless, the term itself has entered popular usage and owing to its vague nature can be applied in many different contexts and in many different ways. It has an elusive trait that, while being hard to define, is easy to apply:

> "More than 5 million people in Belgium use a GSM (that's more than 50%), more than 2 million are connected to the Internet. Hundreds of thousands of messages are permanently exchanged at the speed of light. The content of complete libraries are beamed between continents in seconds. We live in the information society. Amazing!" (Project director of the Liege regional information society initiative)

The history of the concept of the information society is to be found in a variety of sources, including the work of social scientists such as Daniel Bell (1974, 1988) and Alain Touraine (1974), futurist writers and forecasters like Tom Stonier (1983) and Alvin Toffler (1980), cyber visionaries associated with the ICT industry, and more latterly in the pronouncements of senior politicians and policy makers. Whilst differing significantly in the contributions they make to the debate, they all share the

notion that society is being transformed by a revolution in information technology which is creating an entirely new social structure (Loader, 1998).

Such fundamental transformations are now beginning to raise important questions about their consequences for social divisions, diversity and differences. Will they, for example, lead to a greater equalisation of power structures with their promise of access to public information and global collaboration? Or alternatively are they likely to produce a widening of the social cleavage between the information-rich and information-poor?

This chapter attempts to cast some light on these questions using data collected from both RISI and Irish regions. After an attempt to more clearly define the Information Society (and more specifically how it will be employed here) I wish to look beyond the evangelical claims of a new world order to highlight some work on the real impacts of development in the information age. Before looking at the EU initiative RISI, I will question the various types and goals of policy pursuing the Information Society. The chapter will then go on to test claims about the presence of the information society in both RISI and Irish regions. In doing so I will be focusing on various information age assets seen as fundamental requisites for development.

Development in the Information Age.

As has already been pointed out in earlier chapters technologically deterministic thinking is rarely of any benefit. Indeed, it is recognised that this way of thinking can be directly correlated with bad public decision making leading to bad policy measures. Scepticism about the information society is on the increase, with plenty of works including May (2000), Haywood (1998), Holderness (1998), to name but a few that have begun to unearth a chasm that exists in the new digital age; that of the cyberspace divide. This is reinforced by the fact that social divisions and distinction have remained largely untouched by the proliferation of a whole range of computer-based technologies, and the Internet will be no different. A divide exists between the information-rich and the information-poor, and contrary to current Internet folklore, the users do not own the 'means' (Haywood, 1998).

There may be millions of documents available on the World Wide Web, but 70 per cent of the host computers are in the US and fewer than ten African countries are connected to the Internet. A modem in India costs about four times as much as it does in the US, and Internet access can be twelve times more expensive in Indonesia than in the US (Holderness, 1998). While developed nations may gradually increase the range of socio-economic groups that can access global networks, Internet users in developing countries are likely to be confined for many years to a much smaller privileged elite.

As we shall see, the scale on which the divides are occurring are not solely on the national level, but also occur on the sub-national regional scale as well. One author who recognises this view along with a wariness of deterministic thinking is Manuel Catells (1996, 1997a, 1998). Castells' notion of an information society is one that is steeped in the idea of networks in the electronic and computer-based sense as well as networking in a social collaborative sense. It is these two notions that I employ in my testing of the information society in EU and Irish regions. The first is technical in the sense that it refers to hardware and infrastructure and is very much economic, if not mechanistic, in its approach to issues of accessibility in the Information Society. The second is acknowledged by Castells as more social and more removed from the technical aspects and is closer to the actor network theory of Bruno Latour. It is more biological and has issues of adaptability at its heart where people make use of the physical networks to enhance their networking and collaboration as actors living/trading/competing in a new economy.

Castells has proposed that ICTs have produced a new sort of society, the network society. Electronically mediated networks support the development and dissemination of knowledge and information allowing the acceleration of adaptation and discovery. He also suggests, as have others, that developmental processes have shifted from being based on physical resources to an increased reliance on the mobilisation and coordination of human knowledge and information. This is leading to information capitalism and the network society.

As far back as 40 years ago Mumford also wrote about shifts in information technology commencing with human beings own mental activities being directed towards changing things. While technological history has been fixated on the fashioning of tools:

> "the invention of language - a culmination of man's more elementary forms of expressing and transmitting meaning - was incomparably more important to further human development than the chipping of a mountain of hand-axes. . . . For only when knowledge and practice could be stored in symbolic forms and passed on by word of mouth from generation to generation was it possible to keep each fresh cultural acquisition from dissolving with the passing moment or the dying of a generation. Then, and then only, did the domestication of plants and animals become possible." (Mumford 1966: 308)

Similar notions of the importance of voice and trust are heralded by Morgan (2001) and Morgan and Nualwers (1998) as central to the softer notion of networking, and the creation of workable networks between actors. As earlier chapters have pointed out, the type of institutional network is crucial to the ability of the actors within them to engage and succeed in the Information Society. The question that the next section seeks to answer is the exactly what types of networks are needed, and how policy can influence their formation and existence in EU regions.

Development in the Information Age: Information Society versus Information Economy and the Policy Approach

In this chapter I wish to make a key distinction about development in the information age by segregating the information economy from the information society. My analysis will show that both are different from each other and as a result of this difference, policies developed to promote either will also differ. This distinction can best be seen through my comparison of the development of the RISI regions with the regions of Ireland. As the preceding chapters have made clear, the policy approach in both sets of regions has been somewhat different this chapter will attempt to compare the outcome of these approaches.

There also exists an interesting if not slightly confusing dichotomy here; we have seen two different approaches to development in the information age, both have been put under the label of information society policies, but as I will attempt to show, only one really promotes the information society, while the other, which has been deemed a successful information society policy, in fact promotes the information economy more than the information society. The approaches can be differentiated by their mechanistic and biological natures. Where the former favours a more economic IS and the latter a more social IS.

What I see as the differences between the information economy and information society are as fuzzy, sometimes over-lapping and clear as the differences between economy and society in general. To segregate the two is as easy or as difficult as segregating economy from society. For the sake of pragmatism box 8.1 is a crude attempt to differentiate the two according to the different views/uses of the proliferation of ICTs and tools of the information age.

Box 8.1 Information Society versus Information Economy

	Information Society ***(Social IS)***	**Information Economy** ***(Economic is)***
Who/Where	Individuals / In the Home	Companies / In the Workplace
Use	Personal Connections/ Music/ Gaming/ Travel Arrangements / Information/ Access to e-government/ Learning	Business Connections/ Accessing Information/ Creating wider presence/ Buying and selling goods/ Information as a product in the production process
Goals	Increased awareness/ increased networking/ increased access to various kinds of information	Increased competitiveness/ increased capacity to innovate / increased ability to compete on a global stage
Expected results	Adept, information aware population/ Greater amount of Collaboration/ Greater amount of services accessed and available on-line saving time and money	More information workers/ higher-value added cleaner industries aiding a more robust economy

From the above, we can begin to appreciate the differences that exist between both these modes of social production, and also that two very different policies are required in promoting them. Moore (1998) recognises two distinct policy mechanisms in achieving development in the information age and terms them the neo-liberal and 'dirigiste' approaches. In his work he cites examples from different countries and their approaches to information society policy. For Moore, countries like Singapore and Japan have grown rapidly through the use of dirigiste economic policies, while most EU countries (as we have seen in Ireland) along with the US and Australia have followed the neo-liberal policy approach. Moore cites examples of a more vibrant and more social information society in the former than in the latter, and one striking difference he sees in the former approach is that:

> "it views people as participants in the information society of the future rather than simply regarding them as consumers or as potential workers in information-intensive organisations. There is therefore a much greater emphasis on education at all levels. The information policy of the Thai government, for example, places the highest priority on education and training, the aim being to create a whole population with the skills and abilities needed to function in an information society." (1998: 156)

In his work, Moore remains very sceptical of the neo-liberal approach and cites statistics of economic growth rates showing the advantage that countries under a dirigiste/institutional regime have over a market-led approach. At the time of writing, however, the policy approach to the information society in the EU had not yet made the turn towards the institutional. Moore saw the 1997 recommendations of the Higher Level Group of Experts in the European Commission as a glimmer of light in an otherwise dim policy world.

The remainder of this chapter can be seen as an appraisal of both policy approaches. In the next section I look at RISI as an example of a dirigiste policy approach, the section devoted to the Irish regions can be seen as an example of a market-led policy approach to development in the information age. In order to be fair to both processes and outcomes I have adopted a method which will gauge both the economic and social information society assets of each set of regions, these can be thought of as

'harder' and 'softer' methodologies (see chapter 1). Through the former, I will be able to gauge development by mapping out the presence and use of hardware in the form of PC penetration and Internet usage, the tools, according to the supply-led approach that are necessary to progress in the information age. Conversely, the softer approach will gauge the degree of networking and collaboration, key tenets of the dirigiste type initiative such as RISI. What we will see happen here is the evolution of certain types or modalities of development in the information age from the policies that are pursued, a more social approach is more conducive towards a functioning information society, while a more economic approach will favour the burgeoning of an information economy. The reason for looking at both is quite simple; according to Cornford, Gillespie and Richardson (2000) to have a coherent computer network functioning as part of the information age it is necessary to have a particular form of social network in place as well.

The Regional Information Society Initiative: The Dirigiste Approach

The setting up of RISI which focused exclusively on the regional level was very much influenced by many people writing about the economic climate at the time, which was heralding a return to the regional scale (Storper (1997); Castells (1998); Amin and Thrift (1998); Cooke and Morgan (1998); Gillespie, Richardson and Cornford, (2001)). As we have seen from chapter four, the main buzzwords surrounding the initiative were 'learn-by-doing', 'bottom-up' 'building partnerships' and most importantly 'networking'. As its key objective, RISI sought to raise awareness about the information society among the public through information dissemination. The hope was to create a demand among the less favoured regions to enter into the new age. The perceived benefits were to be set out in each region's Action Plan. There existed a degree of difference in what different regions wanted from their own RISI project, but many of the primary goals were shared, such as:

- Increased amount of people on-line at home and through public information points;

- Increased learning and knowledge transferral;
- Increased amount of service sector companies;
- Increased awareness of the Information Society;
- Increased networking amongst key actors.

Making use of workshops and seminars the project leaders set about the task of bringing their regions into the information society.

ICT Assets, Usage and Learning in the RISI regions

The following is an overview of some simple statistics regarding the presence of the information society in each of the RISI regions (see chapter 1 for derivation). It remains difficult because of the lack of statistics on the regional level to enable a comprehensive and unbiased survey of the success of RISI. However, the following will give us an idea of the proliferation of information society technologies across the RISI regions in Europe[1].

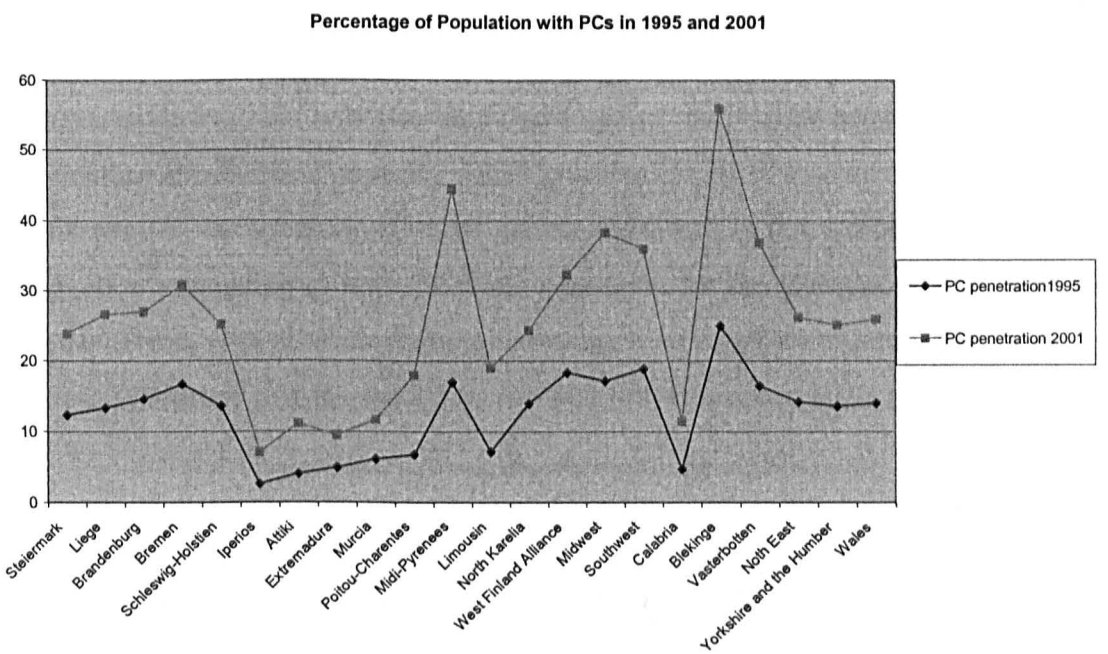
Figure 8.1 shows the percentage of the populations of the RISI regions with personal computers. Recognised by many as the key tool for membership in the Information Society, it is a useful indicator to gauge a region's performance in the information revolution. PC penetration is widely used by the OECD, the European Commission and numerous national statistic offices as well and many theorists such as Holderness (1998):

> "by simply being aware of the proliferation of PCs in people's homes across the world we can better gauge who is winning and who is losing in the information age". (pg 42)

[1] A methodological note is necessary here, the following figures are derived for the regions as a whole, it is not assumed that RISI has been so pervasive as to be the sole influence on these figures. What remains difficult in the interpretation of these figures is gauging the actual influence of RISI. For the purposes of this work the figures I cite are in relation to certain 'goals' of the initiative, it remains easier to interpret figures that are contrary to the goals set out.

The trend series below for the years 1995 and 2001 show that all the RISI regions are 'winning' to some degree, with many doubling if not trebling the percentage (per person) of PCs in their region. The big winners over the six year time period are the Midi-Pyrenees (FR) and Blekinge (S), with both Irish regions also experiencing a significant increase. At the other end of the scale are the Greek, Spanish and Italian regions where the number of PCs per 100 people struggled to reach over 7 in 1995 and 10 in 2001. The figures for the respective nations also remain quite low in relation to other EU partners. The result will come of little surprise when we see the high correlation that exists between countries with poor PC uptake and telephony. The correlation is positive and strong, with all countries with poor telephony presence having poor PC penetration.

Figure 8.1 PC penetration per 100 inhabitants in RISI regions



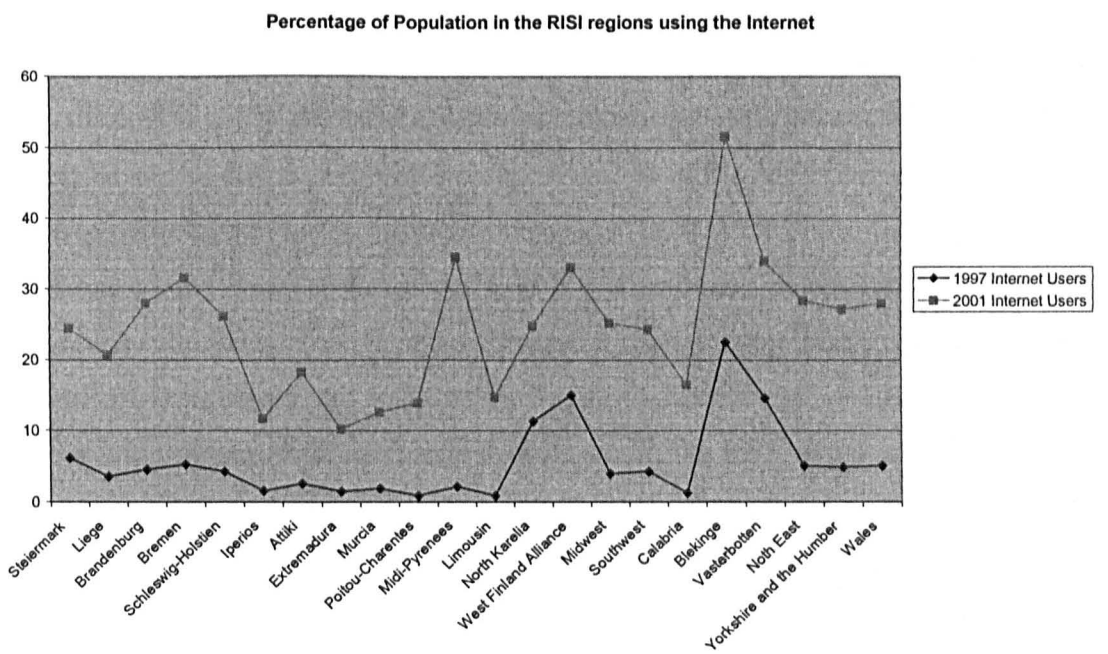
(Eurostat, 2002)

While the picture looks quite positive for the RISI regions in Figure 8.1, showing an increase across all regions, when we place it in the larger context of how regions across all of Europe performed, we begin to see a slightly different picture. In 1995 the average PC penetration rate for Europe was 15 per 100 inhabitants. The same year the RISI regions found themselves 18% behind the average for the EU with 12.8 per 100. Six years later the average for Europe had more than doubled to 31, while the corresponding figure for the RISI regions in 2001 was 25.5. What has happened over

the time period shown is a fall in the RISI regions on the whole to 20% behind the average for Europe. Again the blame for this trend cannot be placed solely on the shoulders of RISI. Because one of the main stipulations behind the choice of the 22 regions was that they were underdeveloped, goes much of the way in explaining this trend. The fact that all the regions were considered less favoured helps explain what we see in figs 8.1 and 8.2 than the fact that they were part of the RISI process.

If PCs are regarded as a key tool for entering the Information Society, it is not least because they act as an enabler for accessing the Internet; something that can be seen as epitomising the information age (May, 2000, 2002). Figure 8.2 displays a decidedly similar trend to that in Figure 8.1. Figure 8.2 is a trend chart displaying the number of internet users per 100 inhabitants in the RISI regions. Here again we see the Swedish regions (Blekinge and Vasterbotten) along with Midi-Pyrenees (FR) and the West Finland Alliance (FIN) coming out on top with the highest percentage of internet users. Interestingly we see the Irish regions drop back slightly; I will deal with this in greater detail below, but will also note that some of the reasons might lie in the state of the nation's broadband capacity which was dealt with in the previous chapter. At the other end of the spectrum are the Spanish and Greek regions, along with Calabria in Italy. It is interesting to note the relative increase for the German regions over the four year period, with all three regions increasing their numbers online significantly.

Figure 8.2 Number of Internet Users per 100 inhabitants in RISI regions



(Eurostat, 2002)

Placing the figure in the context of the EU as a whole we again see a similar trend emerging. When we compare the RISI average to that for the EU, the increases shown in figure 8.2 begin to loose their sparkle. In 1997, an average of 5.5 persons per 100 inhabitants in the RISI regions were Internet users, this compares well with an EU average of 5.2, placing the RISI regions some 5% above the average for the EU. The figure for 2001 is somewhat different. The average for the RISI regions in 2001 was 24.5 persons per 100 inhabitants, while the respective figure for the EU was 31.4. RISI regions then fell from 5% above the EU average in 1999 to 22% below.

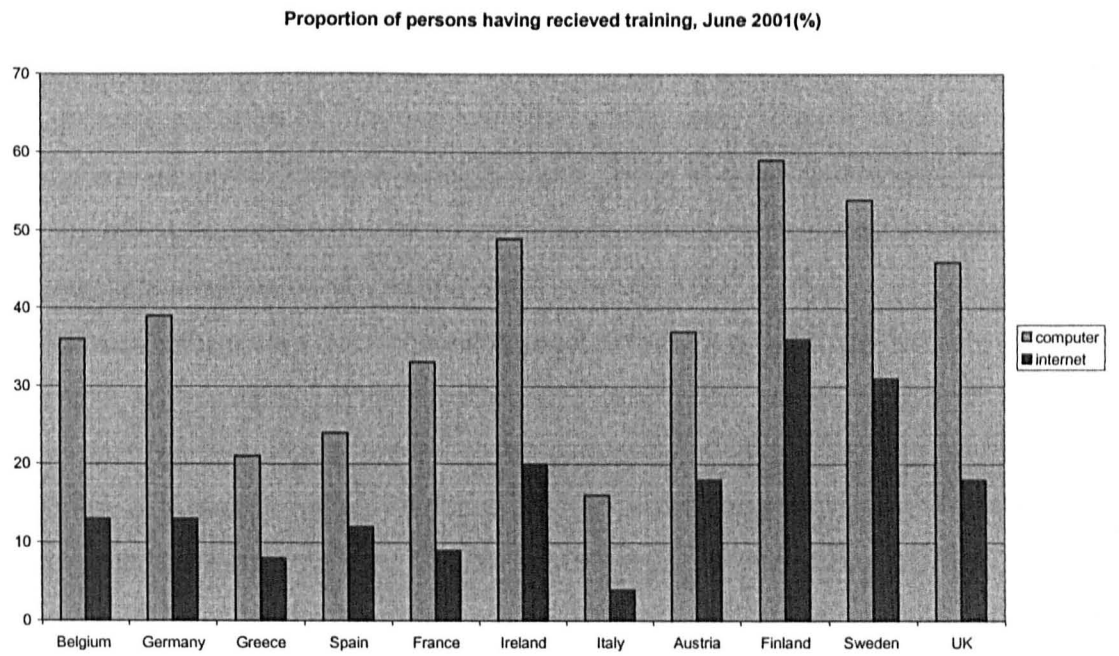
The above figures do not bode well for RISI regions grasping the fundamental tenets of the information age. Indeed, here we are beginning to see that talk of regions joining the information superhighway is a discourse in many regions (such as those in southern Europe and to some extent Ireland) which has little meaning because of both the lack of uptake and poor telecommunications. The writings of Burrows (1997) and Davis (1990) hold true, in that exclusion from the Information Society is not confined to a consistent pattern of a global north-south divide, but is also said to be evident within traditional nation-state boundaries of advanced industrial societies and metropolises.

All other available statistical information, not only compounds this emerging trend but also highlights how increasingly difficult it is becoming to alleviate it. While regional figures are not available, national figures for ICT training and Public Internet Access Points (PIAPs) show the divisions on a national level between European states in their ability to adapt to the Information Age. Provision of PIAP is another of the pillars of participation in the information society (RISI, 1998). They offer opportunity for access to the Internet to all parts of the population, particularly for the more excluded that are less likely to benefit from the availability of the Internet at work or in academic institutions and feel that they can not afford it at home. Eurostat figures show a wide disparity between the Nordic countries of Finland and Sweden and countries in southern Europe. The former have close to ten times as many as the latter and it is reasonable to assume that the same disparities exist among the RISI regions in those countries.

PIAPs have many different connotations for the RISI members, with those in Ireland, Finland and Sweden placing great emphasis on them and their ability to decrease the digital divide. Opinions of Southern EU members were not so positive, generally considering them to be a waste of resources because the people they were targeting did not know how to use them (RISI Survey Material). At the base of this, is the key issue of knowledge acquisition and ICT training in the information age. This has been recognised by all regions as one of the keys to success and a great deal of emphasis has been placed on ICT training by RISI and many more national and EU initiatives.

Again, figures for ICT training on a regional level are non-existent, but those for the national level portray an all too familiar trend. These are displayed in figure 8.3 below, with figures for the proportion of persons having received training in both computers and the Internet. Broadly speaking the RISI countries can be split into two separate categories, those with their average above that of the EU, and those with it below. Again, we have the Scandinavian countries leading the way along with Ireland and the UK. Germany and Belgium are the other two countries above the EU average. The other set of countries are those below the EU average, here we have France which remains slightly below, while Greece, Italy and Spain lie much further behind.

Figure 8.3 Computer or Internet Training in RISI countries, June 2001



Source: Eurostat (2002)

The trend in ICT adoption and hardware is mimicked by the trend in ICT training. With a lack of training in the less favoured regions, the end result can only be an increase in the digital divide between regions and countries. RISI has been bellicose in its promotion of learning as a fundamental step towards development in the information age. Indeed many, if not all Strategy and Action Plans of the 22 regions have a great deal of emphasis placed on learning and training. Under every action plan, one of the usual five or six pillars of concentration is wholly devoted to it. Examples are:

> "Measures for education and training need to prepare people for the changing work environment of the Information Society with increasing emphasis on flexibility, contract conditions, mobility, self-employment, teleworking and continuous change"
> (Shannon Strategy and Action Plan 1998, pg 42)

> "To support the development of new, modern education programmes in the field of exploiting information technology. Create regular education forms, common for both educational organisations and information technology enterprises in order to improve the co-operation and the students' prospects of getting a job."
> (North Karelia Strategy and Action Plan, 1999, pg. 65)

> "Wales - a country where individuals, education and business work together to generate a culture of life-long learning and the acquisition of skills for successful enterprise development, leading to higher levels of employability and adaptability, improved access to education and training opportunities, better patterns of work, and capitalisation of new employment opportunities."
> (Wales Information Society Strategy and Action Plan, 1999, pg.5)

However, the reality has proved to be somewhat different. Setting education and learning as a policy objective comes highly recommended by theorists and policy makers alike (Loader, 1998, Cooke and Morgan, 1998). However, how well this transforms into reality can be much different. What is obvious is that the countries/regions that seem to be succeeding in the Information Society are the same ones that have a high percentage of people trained in the use of ICTs. A virtuous

circle can be seen to exist in those regions, where new technologies are adapted to more easily. If the regions that struggle with regards to adapting to the information society do not set this kind of circle in motion through increasing awareness of ICTs through training programmes, then a degree of technological inertia is bound to take hold.

Survey results from the RISI regions complement the above statistical findings regarding increased learning. Some 60% of the regions thought the goal of increasing learning through the intiatitive was too great a task. There was a feeling that while it was important, and as it was set out as one of the major goals, that it was beyond the scope of the project when it came to putting it into action. One respondent from the North East of England went as far to say:

> "I suppose we knew that we were overstating it a bit. I mean for the amount of money we actually got, it was unrealistic to think that after RISI we were going to end up with a region full of computer literate people from all walks of life"

Other regions were even less enthusiastic about the creation of a learning environment within their region. A predominantly rural region in Spain cited the fact that people 'just did not want to sit in front of computers'. Conversely, the Shannon region in Midwest Ireland saw huge benefits from the promotion of learning in the region, citing reasons such as huge demand and the fact that there already existed sufficient awareness of the information society in the region. The latter point has proved key in achieving the goal of increased learning; awareness raising is seen as significant step along the way to creating a learning environment. Opinions on this goal were much more positive with all respondents placing it in the top three of positive outcomes of the initiative. When asked to explain 'how and where awareness was increased?' one of the fundamental problems to rolling out the information society came to the fore: all regions admitted that awareness raising, while obvious in the region, also had an evident geography, one biased towards urban areas, and among the young middle class.

Among the RISI regions it is hard to decipher a linear technological progression. What we are beginning to see is an information society characterised through the

often competing social forces of innovation, competitive advantage, human agency and social resistance. Where the benefits of ICTs are unevenly spread and the disadvantages are particularly concentrated in 'the black holes of human misery', (Castells 1996: 2) it does not seem unreasonable to suppose that the cyberspace divide will become more and more a significant feature. To what degree an initiative like RISI with its social approach will bring about a lessening of this divide is also questionable. From the evidence above we have seen some positive progress in terms of the more social aspects of the information age. However, we have seen very little in the way that this has translated or evolved into the more economic guise of increasing technological capabilities throughout the region via increased use of the new information age technologies. In terms of creating or stimulating an economically robust information society in the 22 regions, this dirigiste approach has had little impact to date. However, once we consider the size and especially the timescale of the initiative it is more difficult to see how RISI and its dirigiste approach could have.

Networking and Collaboration in the RISI regions

The concept of networking has been one of the primary policy components of RISI. As has been argued in previous chapters, the rationale behind the promotion of networking is the collaboration and collective bargaining it engenders. The concept of collective learning has also become an integral part of the information society in relation to the capacity of particular networks of actors to generate and facilitate innovative behaviour through the creation and further development of a base of shared knowledge among individuals within a productive system (Lawson, 1997).

The role of networking is recognised as a critical component of internationalisation in the global information society. Theorists like Macdonald (1996, 1998), Welch (1999) and Camagni (1991) note the importance of networking in creating information through the dissemination of knowledge. Other theorists such as Castells (1996) and May (2000) note the dual meaning and importance of the term networking in the information age. It is a case where the term while, meaning very different things, essentially implies the same result. There is a near symbiosis in the use, in that

networking in terms of hardware and computer networks, facilitates the networking of collaboration, and vice versa.

The recognition that innovation is found in the collaborations of many different actors (state bodies, firms, universities, research laboratories) has become more popular since the rise of new technologies (see Grimes and Collins, 2003). RISI has recognised this and has indeed placed a great deal of emphasis upon it. Networking concepts here involve partnership building and are seen as an integral part of the 'bottom-up' approach which is seen as one of the defining traits of the initiative. The promotion of networking is also seen as a key policy differentiator from the approach of the neo-liberalist top-down approach (Moore, 1998).

In chapter four we saw that the guidelines of RISI placed a great deal of emphasis on networking and partnership building which was particularly evident in the region's Strategy and Action Plans. Indeed in the Guide to Developing RISI one of the five chapters is wholly dedicated to it:

> "The importance of networking to the bottom-up and participative approach adopted by the RISI regions is emphasised as it pervades all phases and processes of the initiative" (1998: 54).

Networking here is very much concerned with social and organisational interaction as the best method of learning. The information society posed a set of challenges which the RISI regions needed to confront and learning from each other has played an important part in developing their competences and in securing their achievements. At the same time as RISI delegates were exploiting opportunities for inter-regional networking, they were busy developing networks and partnerships in their own regions. The intended benefits were the same as those foreseen for inter-regional networking: namely learning from the experiences of other participants; sharing/exchanging of best practice knowledge and experience; and the creation of new partnerships.

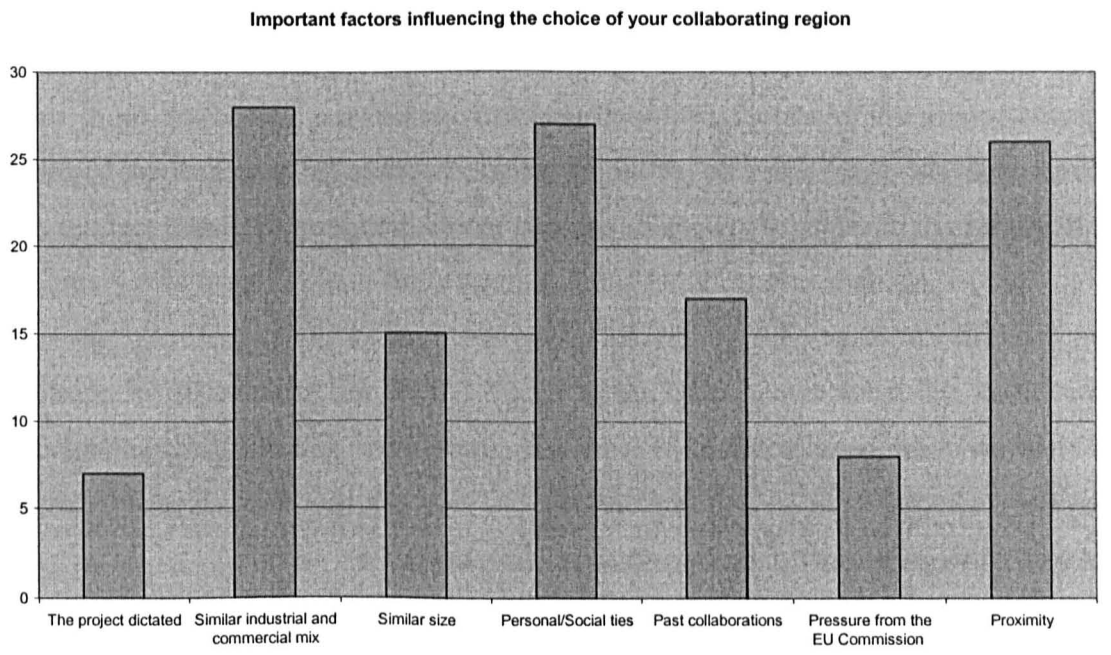
Co-operation and collaboration within and outside the region is high on each project agenda for the RISI regions. Survey results suggest that it has also been one of the main benefits of the initiative, with respondents ranking 'increased networking' second, behind 'increasing awareness of the Information Society'. The results were

consistently positive across most regions, but networking was ranked slightly higher among the southern RISI regions.

In terms of intra-regional networking, each region was asked between which organisations had RISI most influenced collaborative ties inside the region? The answers were, for the most part, positive in that the region identified strong collaborations between the public, private and educational sector as a result of RISI. Differences remain in the types of organisations that collaborated within regions. The differences were due to the nature of the projects in each of the different regions. The RISI project in Bremen (D) for example was much more social in its orientation and therefore cited increased networking between social organisations in the region such as charities and employment agencies. The focus of the RISI project in Liege (B) was more concentrated on increasing the innovative capacity of the region and therefore it cited research laboratories and higher education institutes as actors between which collaboration had appreciably increased as a result of RISI. A similar theme ran through the answers to questions put to Project directors as to who best they collaborated with. The answer in Liege was with the University of Liege, in Bremen, with Union Groups and Employment Agencies. In Extremurda (E), a more business oriented project, project leaders collaborated best with the business community.

Similarities between regions were cited as the primary reason for inter-regional collaboration amongst RISI regions. Universities within regions were most commonly cited as the organisations which best collaborated with other organisations outside the region. In terms of the most collaborations between regions, 70% of the respondents listed the regions in the same country as the ones they best collaborated with. The Southwest and Midwest of Ireland, Northeast England and Yorkshire and Humberside, Bremen and Scheswig-Holstien, Tampere and Vasterbotten, all cited each other interchangeably as the partners with whom the collaborated best. The reasons for these intra-regional collaborations are given in Figure 8.4.

Figure 8.4 Reasons for intra-region collaboration (max = 30, min = 8)



Source: Adopted from Survey Material

The importance of personal and social ties appeared very often in surveys returned by the RISI regions. When asked whether they viewed the successful collaborations of RISI as formal, informal or a mixture of both, echoing the work of Macdonald (1998) the emphasis was put on informal ties with half the respondents seeing their networking as informal:

> "Informal ties are very important and many of the project ideas and joint ventures have been developed 'off the record'. A good network needs a good degree of informality to successful" (Bremen)

A further third saw them as a mixture:

> "Ties were first formal, but became informal when we continued with the thematic workshops and seminars" (Schleswig-Holstien)

The Liege region, however, saw most of their ties being created on a formal basis, here again we can see that the nature of the individual projects have an effect on how

networking is viewed. Liege sees a higher degree of concentration of innovation than other RISI and Belgian regions. This concentration brings with it a high degree of investment and where financial stakes are high, the Liege project leader claims that ties need to be formal.

There is no doubt that networking has been heralded as one of the major success stories of the Regional Information Society Initiative, all respondents strongly agreed with the fact that RISI bought different sections of society together in the information age. Interviews from my case study regions abound with quotes such as:

> "I suppose if it wasn't for RISI I would never have known what the Institute of Technology in Limerick were doing, and how it complemented what we were at here"
>
> Representative, IT Department, University of Limerick

RISI has attained the goal of bringing different actors together to work in the information age. It is reflected in later initiatives like ASPECT, where the director Gareth Hughes was quoted as saying:

> "Coffee Break, Lunch, Coffee Break, Dinner... these are the most important parts in our agenda for ASPECTs annual conference"
>
> Lille, Nord-Pas-deCalais

The results of my surveys, backed by many of the regions' final reports on their RISI projects, suggest that RISI has been a success in terms of forming collaborations necessary to succeed in the information society. However, the fact remains that networking and collaboration remain elusive and somewhat hard to define, for that reason RISI's success story also remains hard to identify. In terms of the less tangible factors like partnership building, the RISI regions are said to be a vibrant part of the information society, but with regards to earlier analysis on more tangible factors like the pervasiveness of ICTs in the form of PCs and internet usage, RISI regions are deemed much less successful.

It still remains hard to decipher the effects that RISI can have had when the projects' primary goals were to become part of the Information Society, a goal, owing to the

nature of the global economic environment, sought by every other region and country across Europe in the latter half of the 1990s. While the proliferation of ICTs in RISI regions has been on the increase over the life-time of the initiative, it is also true that they have increased at a rate less than the EU average. Having said that, many of the main economic indicators for much of the RISI regions have also increased at less than the EU average over the same time period. All 22 regions were among the less-favoured regions in a Europe that has seen an increase in the gaps between its richest and poorest regions.

The general opinion about RISI held by many of its members is a positive one. It may not have necessarily changed any or all of the regions' development trajectories, but that was not the goal of this relatively small EU IST programme. RISI was successful in increasing awareness of ICTs and in creating partnerships in and between the regions, which are seen as crucial developments on the development path in the information age. Owing to its 'experimental' nature, it can be held up as a positive for the institutional turn it embodies. The RISI regions have learned a great deal more by sitting down and dealing with peoples demands, than other regions which adopted the supply-led approach which dominated EU policy making in the first half of the 1990s. The end result has seen a more social development in the information age, and although it may not have had a huge impact in terms of information economy, in terms of information society, the small initiative of RISI can be deemed a success for placing the emphasis on the social tenets necessary for development in the information age. In the next section I will look at Ireland as an interesting case in point, where two of the eight regions were successful members of RISI, they followed a path more attuned with the demand side, which contrasts nicely with the supply-led nature of national policies. The end result of the pursuit of the different approach in Ireland has seen its regions follow a very different development path in the information age.

Regional Development in Information Age Ireland: The Market-led approach

"I am proud to say that due to our rapid progress in recent years, Ireland is becoming a leading member of Europe's Information Society"

Bertie Ahern, Dublin Castle, September 2002

With statements like the above from the Irish Premier, Bertie Ahern, one could be forgiven for seeing Irish Society as one steeped in ICTs, always on-line and wired. In this section I will challenge the idea of an Irish information society, which I believe is much more correctly defined as an information economy. I will do this by firstly looking at Ireland's approach to the Information Society, one that has been heavily influenced by the EU throughout the 1990s. After making brief reference to Ireland's IS assets in relation to the rest of Europe, I will probe further into the regional dimension of the IS in Ireland where interesting comparisons arise.

The Information Society concept reached Ireland through a filtration process from Brussels. Evangelistic notions about a world transcending space and place seemed an ideal answer to the Irish predicament. Throughout the early 1990s, the information society concept was sold across the world as the most effective way to kill off the problem of distance once and for all. In Ireland, a peripheral island in the northwest of Europe, the idea of the 'death of distance' was extremely enticing. With such an impetus behind the State, Ireland followed the EU in creating the kind of environment in which an information society would take root, and one of the first steps it took along with all other members was to liberalise its telecommunications market.

Paschal Preston (1995) argued that EU policies promoting privatisation of telecommunications networks in member states would lead to concentration of private-sector control of these networks at the continental and global levels, ultimately creating an environment in Ireland and the other peripheral nations which discourages innovation, content diversity, competition and market entry into new telecommunications services. A later report published in 1999 by the advisory committee for telecommunications found that Preston's predictions had actually rung true. They highlighted a number of deficiencies such as lack of competition, lack of broadband and high interconnection charges (see Gillespie, Richardson and Cornford, 2001).

In both Ireland and in the European Union, there has been increasing acknowledgement of the social dimensions of these developments, with repeated references to the dangers of a two-tier information society emerging, leading to

divisions between information-haves and information-have-nots. However, the policy documents evolving from these discussions do not seriously address these concerns. For instance, in the introduction to its 1996 report, the government industrial policy agency Forfas states: "It is important ... that a coherent policy be developed that will ensure that all citizens can benefit from the changes taking place" (Forfas, 1996:i). In the report itself, however, there is no hint of such a policy. The citizen is absent from the analysis, which focuses on business applications of advanced telecommunications.

The White Paper on Science Technology and Innovation noted among the possible unacceptable and undesirable outcomes of the further development of the information economy, the "deepening of social cleavages, unequal distribution of access to, and the benefits of, the information society and so on ... we must avoid creation of the two-tier information society - those who have preferential education and access to the means and those who are at risk of further marginalisation because they have not" (Department of Enterprise and Employment, 1996:43). The White Paper insisted that "the development of the new age cannot be left solely to market forces."

The Forbairt report, *Ireland, The Digital Age and the Internet* (1996) proposed, more concretely, "a series of seminars ... around the country [which] would help to inform local communities of the opportunities opened up by the Digital Age, and of the infrastructural needs of industry. The seminars could also provide an introduction to the key technologies driving the transformation of society, and open up a debate on the social and cultural issues involved."

Increasingly, international bodies such as the European Commission refer to the "information society," rather than to "information highways" or "information infrastructure." This has strengthened the suspicion expressed by O'Siochru, the author of several consultancy reports for the European Commission that the rhetoric about "people first" and fears of an information-rich vs. information-poor division in society are a smokescreen for the real agenda of liberalising telecommunications (O'Siochru, 1996:34).

In March 1996, the Irish Minister for Employment and Enterprise established an Information Society Steering Committee to advise the government on its "information

society" policy. The committee was comprised of: 11 members from the corporate sector, six from government, two from the academic community, one representing trade unions, and none from the community and voluntary sector. Only two of the 20 members were women.

The committee received several submissions stressing the need to support information technology use by community and voluntary organisations, including one which stated that "strategic financial support will be necessary to ensure that voluntary organisations and community groups will be able to continue to make a substantial contribution to all areas of public life in Ireland." (O'Siochru, 1996: 36)

The Committee issued its report in March 1997, *Information Society Ireland: Strategy for Action,* published by Forfas. The recommendations did not specifically address the needs of community and voluntary organisations. However, it recommended an income tax credit for new computer equipment for household use, which may benefit smaller organisations operating from someone's home. The report also recommended providing public access points to the new technology in local communities, an area which could be developed by community and voluntary organisations.

A key recommendation was to establish an Information Society Commission to shape and manage the strategic framework for the Irish information society. According to its mission statement:

> "The Information Society Commission (ISC) is an independent advisory body to Government, reporting directly to the Taoiseach. It draws on high-level representation from the business community, the social partners, and government itself. The ISC has a key role in shaping the evolving public policy framework for the Information Society in Ireland. It contributes to the policy formulation process, monitors progress, and highlights issues that need to be prioritised."(www.isc.ie)

What, in actual fact, the ISC has turned out to be is essentially a clique of representatives from a handful of multinational and indigenous software firms located in Dublin city. Of its 21 members, 3 could be described as coming from outside of the private/academic sphere. It does not include a meaningful representation of the

community and voluntary sector, but instead represents the wishes of a small, and well off few (Itech-research.ie). It has an extremely low profile and is notoriously bad at communicating its agenda. Its profile in the Irish regions is virtually non-existent among all regional actors, from public to private to voluntary and community.

In chapter three I compared Ireland's Information Society Index to those of the rest of the EU. As was made clear, Ireland's performance vis-à-vis its European neighbours in terms of this index was rather dismal. What is most disturbing about this is the fact that in many other economic measures, as we have already seen, Ireland comes out on top. Ireland has the widest gap between economy and society in the Information Age. This has serious consequences for Irish policy makers who must recognise that in order to close this gap a more socially conscious approach to the promotion of ICTs needs to be taken. As we have seen, the mechanistic policy approach has had a variety of impacts on Irish business, on a national scale mostly positive, but on a regional scale less so, while in a social context the above figures show that it has been of little success at all. Analysing Ireland's Information Society in an international context paints a poor picture for the country, now let us probe further into how Irish society has developed in the information age.

ICT Assets and Usage in the Irish regions.

Regional variations in ICT usage in commercial activity and software firms were noted as one of the defining features of Ireland's information economy. As table 8.1 and maps 8.1 and 8.2 show, the degree of differentiation among Irish regions in terms of information society assets remains. The ordering of Irish regions by information economy assets is mimicked by the ordering of regions by information society assets.

Table 8.1 PC penetration and Internet usage 2003

Region	PC Penetration No. of Households '000 (%)	Internet Usage No. of Households '000 (%)	PC Penetration Percentage of Households by region	Internet Usage Percentage of Households by region	No. of Households in each region '000 (%)
Midlands	26.5 (4.4)	17.7 (3.8)	36.2%	24.1%	73.3 (9.7)
Border	50.8 (8.2)	40.2 (8.7)	34.3%	27.2%	148.0 (10.8)
West	45.4 (7.8)	37.0 (8)	32.3%	26.3%	140.5 (10.2)
Southeast	54.9 (9.5)	40.4 (8.8)	38.3%	28.2%	143.3 (10.5)
Southwest	74.0 (12.8)	60.7 (13.2)	36.7%	30.1%	201.6 (14.7)
Midwest	46.6 (8)	38.2 (8.3)	40.3%	33.0%	115.6 (8.4)
Mideast	73.2 (12.6)	54.7 (11.9)	53.8%	41.2%	136.0 (9.9)
Dublin	205.0 (35.5)	169.8 (37)	50.5%	41.9%	405.7 (29.7)
State	576.4 (100)	458.7 (100)	40.3%	31.5%	1,364.1 (100)

Source: CSO, 2003

In absolute terms for the number of PCs in Irish households there is a wide difference with respect to their presence in the regions. The Midlands regions only accounts for 4.4% of the nation's PCs, while Dublin and the Mideast account for nearly half. The number of households with internet access shows a slightly wider disparity, with Dublin and the Mideast again accounting for half, while the Midlands regions can only register 3.8% of the Ireland's on-line households. While the divide is obvious in absolute terms, there is some solace to be gained from the fact that the divide in social terms is not as great as in economic terms.

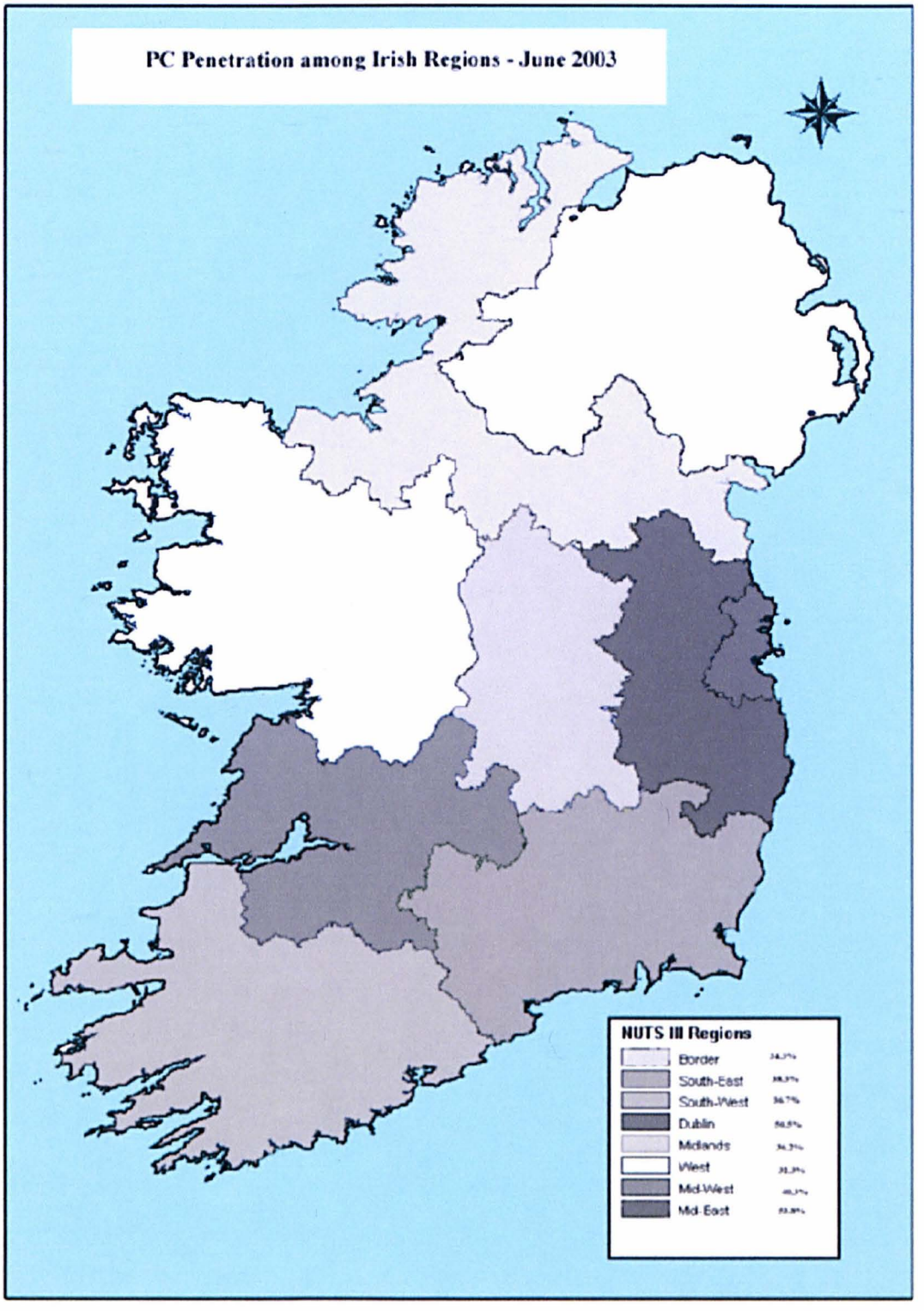
Maps 8.1 and 8.2 depict the figures from the last two columns of table 8.1. Relative to the amount of households in each region, PC penetration refers to the percentage of households with a computer permanently in the dwelling. Here the least coverage is in the Western region with less that one in three households having a computer. The west is closely followed by its less well off neighbours the Border and Midlands regions with 34.3% and 36.2% respectively. The Dublin and Mideast regions again lead the way, with over half the households in each region owning a computer. The

remaining regions (Southwest, Midwest and Southeast) make up the middle ground. From these figures we can identify three different geographic tiers in the Irish information society, with the three regions that form the middle group somewhere close to the average for Europe, and Dublin and the Mideast a deal ahead of the average, with the Border, Midlands and Western regions accruing a score considerably below the EU average.

A not too dissimilar pattern emerges for Internet usage in Ireland but here the gap between the less connected regions and better connected regions is larger. The three groups can again be identified, with Dublin and the Mideast leading the way well above the EU average at around 41% of households, the Southeast, Southwest and Midwest regions, all in and around the EU average, while lagging behind are the Border, Midlands and Western regions, all considerably below. Issues of access are at the heart of the problem here, and as already identified in chapter seven it is in the latter regions where broadband availability is at its worst, while in the Dublin and Mideast regions, they not only enjoy access but have a multitude of suppliers to choose from. What is again most obvious here is the exclusion of the less well off regions in Ireland in the information society, a society that was adopted on its premise of eliminating distance and creating an equal geographic playing field. Maps 8.1 and 8.2 show that if immersion in ISTs in Ireland is doing anything, it is, in fact, adding to the geographic inequalities in the country (see Martin, 2000).

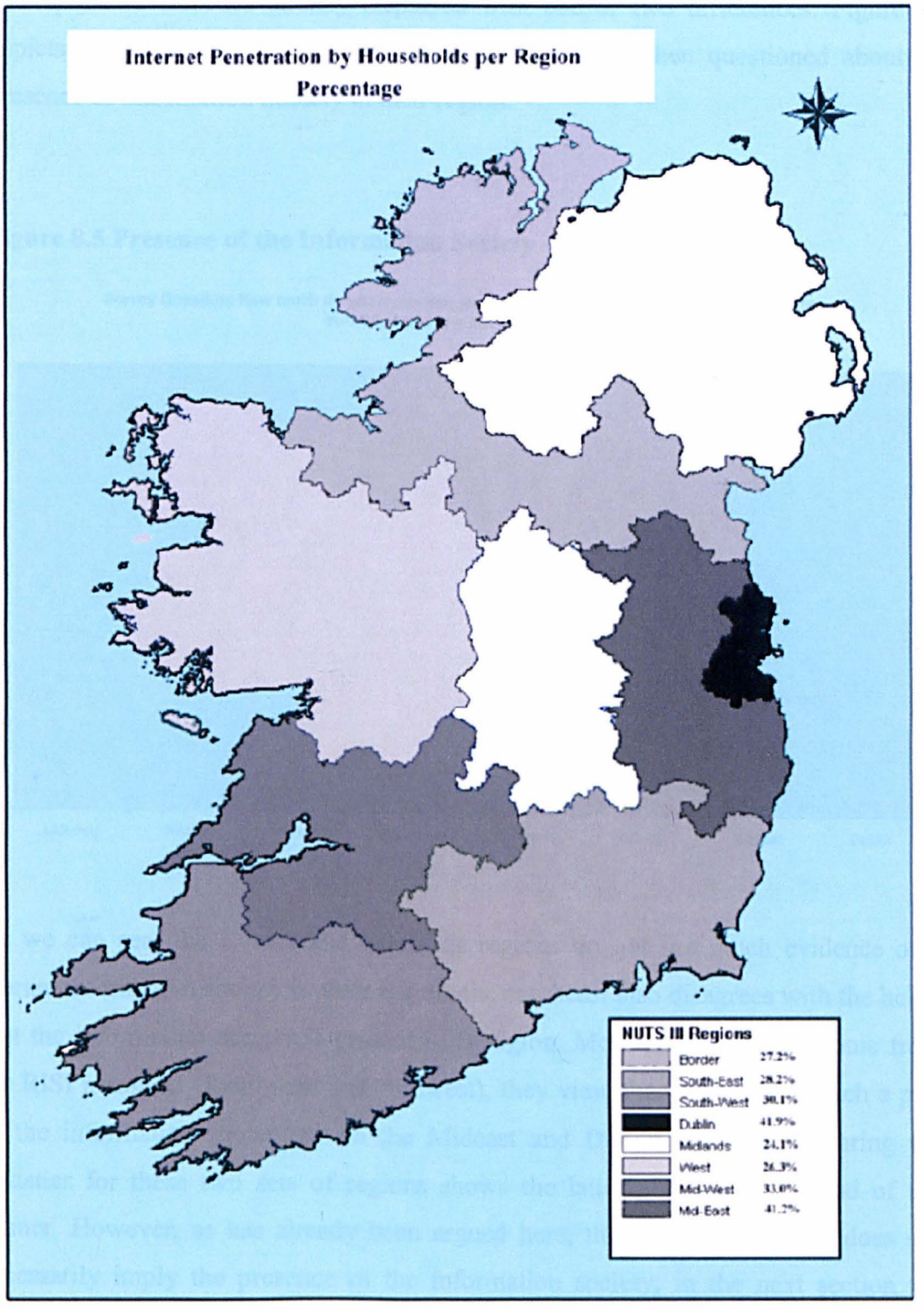
On a national scale Ireland's score on the Information Society Index is well below the EU average. From the above we have seen that for some regions Ireland actually scores above the EU average in terms of PC penetration and Internet Usage, but there are parts of Ireland which remain worse off in these terms. If we can say that the Information Society has reached Ireland, we must say that it has reached only certain parts of Ireland.

Map 8.1 PC Penetration in Irish Households



Source: CSO figures (2004)

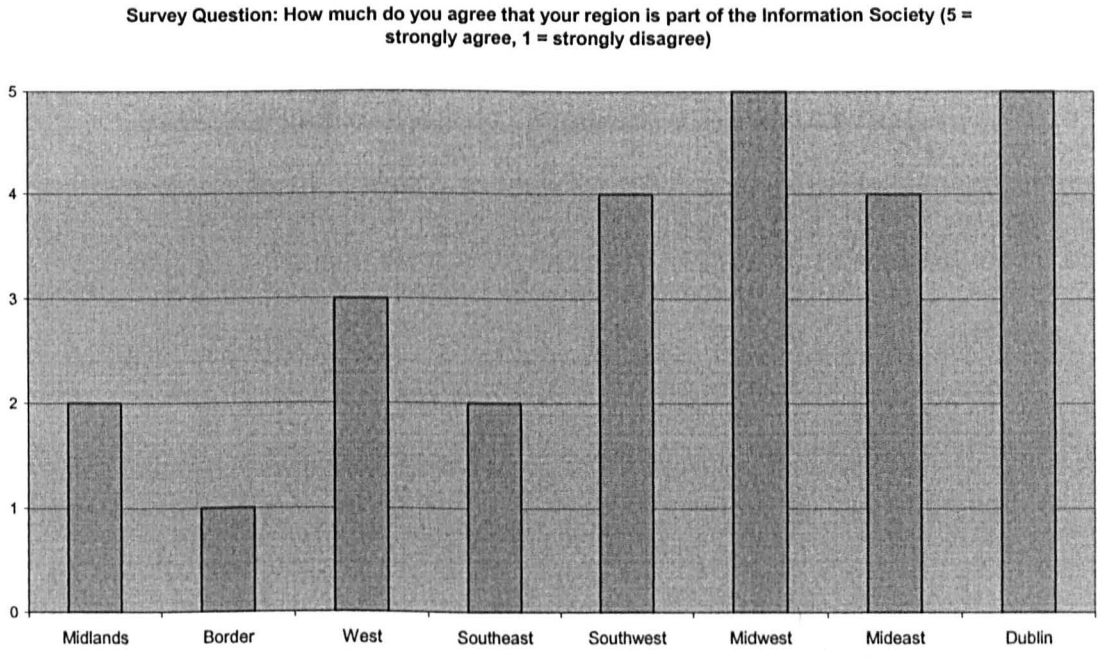
Map 8.2 Internet rate in Irish Households



Source: CSO figures (2004)

Survey results support this claim. The Irish regions have very different ideas on the presence of the information society in their region. To a large extent their views correspond to statistics already displayed with one or two differences. Figure 8.5 depicts the responses of the eight regional authorities when questioned about the presence of Information Society in their region.

Figure 8.5 Presence of the Information Society

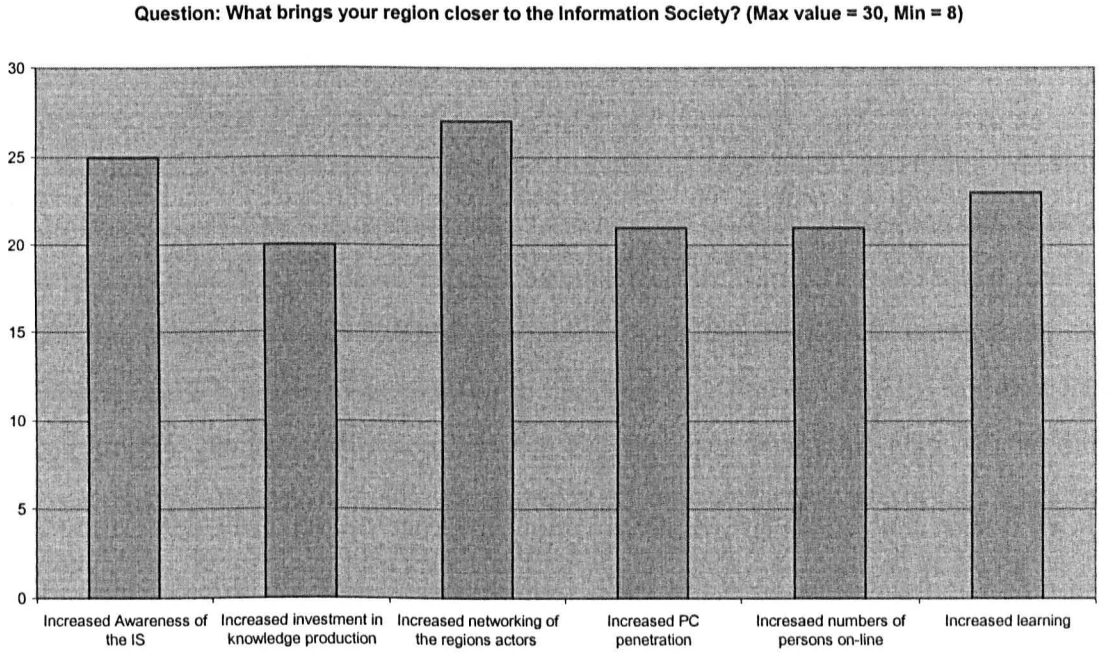


As we can see, the Border and Midlands regions do not see much evidence of a vibrant information society in their region, the southeast also disagrees with the belief that the information society is present it its region. More positive views come from the RISI members (Southwest and Midwest), they view their regions as much a part of the information society as do the Mideast and Dublin region. Comparing the statistics for these two sets of regions shows the latter considerably ahead of the former. However, as has already been argued here, the presence of ICTs does not necessarily imply the presence of the information society, in the next section we explore this further.

Networking and Collaboration in the Irish regions

The question 'What brings a region closer to the information society?' was put to the all Irish regional authorities. Figure 8.6 shows which facets the eight regional authorities thought were most important for advancement in the information age. The results are interesting and not what might be expected:

Figure 8.6 Crucial facets for becoming part of the Information Society



In figure 8.6 we see PC penetration and increased internet usage taking a back seat to awareness raising and increasing collaboration and networking as key issues in bringing Irish regions into the information society. This recognition in itself is a step forward away from the supply-led policies that attempted to bring the internet to the regions. Increasing the level of learning is also seen as important. That said, we should be wary not to read too much into the positioning of the different facets as score of 21 for PC penetration and internet usage are still high.

Looking at individual scores for the regions highlights some marked differences between them. Different regions have ranked the different facets differently. Looking firstly at Dublin and the Mideast, both regions rank PC penetration, internet usage and

networking highest, and awareness raising lowest. The Midlands and Border regions highlight the same in terms of ICTs, but actually rank networking and learning lower. In the RISI regions (Midwest and Southwest), networking is seen as the number one facet by far, followed by awareness raising and learning.

The differences that emerge can, to some extent, be explained away by putting the emphasis on what the regions lack or already have. Dublin and the Mideast may claim to be part of the IS because of the proliferation of PCs in both regions, and therefore justify it by placing PCs as one of the number one facets of the IS. Regions like the Border and Midlands, which claim not to be part of the IS, can blame it on the fact that they need more internet access in their region, therefore claiming that internet access is fundamental to the IS explains their exclusion.

But the emphasis placed on networking by the RISI regions is interesting[2]. Making use of these interviews we can appreciate a very clear difference between actors in the RISI regions and those without. It is no surprise to learn that different sectors, be they public or private, espouse differing opinions on the value of networking and collaboration. What proved interesting in interviews carried out in RISI and non-RISI regions is the general difference between the two sets. While at no point would I suggest that the difference is wholly due to RISI, it may be true that it had some role to play.

The first set of quotes are from a selection of actors in both RISI regions.

> "one of the strengths of the Shannon region is that people can get together to make things happen... there is an ethos of collaboration here, we know each other and you know what we can do to make the region better. We were lucky to get in at the ground level with networking through EU initiative"
>
> Managing Director, MAC ltd. Limerick

[2] Interpreting it on its own would require a great deal of caution because of the fact that the respondents were aware that I was carrying out a study on the initiative itself. However, interviews carried out in the regions with non-RISI partners gives a more objective view.

"Well you look at things like RISI and other EU initiatives that have got us working with guys we never knew existed - without those initiatives we would not be here today"

Director of DIES education, Cork

Interviewees in both these regions from different spheres recognise and advocate the important role networking plays in their organisation. Many of the actors freely used terms such as 'institutional thickness', 'vertical integration' and 'informal networking and partnership building' with ease. There was substantial awareness as to what other actors in the region were pursuing and an openness regarding their work that was hard to find in other regions.

The following are examples of quotes from interviews in non-RISI regions:

"Well the thing is that there is still a lot of coveting of information around here...people are not as inclined to share, there is a fear of losing out or been taken for a ride"

MD Sybernet Ltd. Galway (Interview May, 2002)

"You really have to get people to put money down before you can get any real trust going ...formal networking is the only networking of worth going on here"

Town Manager, Athlone, Co. Westmeath (Interview: August, 2002)

"We really don't have the coherency here that is needed, I mean I wouldn't know anyone from Udaras or the Regional Authority, yet we are supposedly working towards the same goal as them"

Liaison Officer, WDC, Ballinadreen, Co. Roscommon (Interview: July, 2002)

From the West and Midlands region we see a very different take on the importance of networking. It is obvious that the actors are aware of networking, but unable to set it in motion. In the last chapter I showed how the differences between my 'policy-on' regions, the Midwest and Southwest and my 'policy-off' regions, the Midlands and West were few in terms of the language they employed and the goals they sought for their region. In this chapter we have seen these differences multiply under scrutiny and how the two sets of regions do indeed differ. This difference stems from different

structures of governance and respect for local governance in the two sets of regions, the importance of which was discussed in chapter four and the result of which we see here. The Midwest region is in the enviable position of having an independent development agency that looks out for the interests of the region. Shannon Development is in itself the epitome of local governance, and the success of the model has been replicated the world over (Share, 1992). By comparison the Southwest has adopted the regional authority model extremely well and used it as an animateur of local-led development. The above is reinforced by the opinions of actors in the respective regions; both agencies are well placed and respected as a major driving force behind the development of their respective regions.

The same cannot be said for the other set of regions. The Midlands and West for many reasons have been unable to develop the same kind of coherency and respect in their regions. The most cited of these are; non-functional region, lack of time, and too many development actors (survey material). Neither the Midlands nor the West region are as fortunate in terms of the delineation of their boundaries as the Southwest and Midwest. The latter are better defined as functional regions where economic flows between areas within the regions are strong. The same cannot be said for the former, where parts of each region (Ballinasloe, Tullamore, Boyle, etc) serve as nodes in economic networks that lie outside their region. For this reason there is a lack of regional economic constancy within each of the regions which makes the demands of the region's actors much harder to serve.

With regards to time, the regional authorities in the West and Midlands believe that they have not yet had enough time to build up the trust that is crucial in network formation, unlike Shannon Development and the regional agency in Cork, these RA's are relatively new and do not have a good enough presence in their regions. What is unique to these two regions is the multitude of development actors in both regions. Parts of the Midlands and West regions are under the control of as many as five development agencies, including Udaras na Gealtachta, the Western Development Commission and Shannon Development, each of whom have a different agenda in how they want to see the regions develop. Udaras, for example promotes industry in Irish speaking areas, with the primary goal of preserving the national language and culture. The WDC sees their role as promoting industry in the smaller towns, to keep

firms from relocating to the bigger cities. Shannon Development takes on a more international perspective through the attraction of MNCs to the area. Different and even contradictory agendas bring with them confusion and mistrust, with many of the region's actors preferring to side with one agency over the other, and a lack of collaboration between them. The end result of this is that both the West and Midlands lack the kind of policy coherency and cohesiveness which many theorists such as Amin and Thrift (1995), and Cooke and Morgan (1998) deem essential for regional development in a global economy.

Conclusion

The Information Society that is alleged to be burgeoning across the world remains, like many epochs in their infancy, very hard to define. Many theorists and policy makers have struggled with its illusive nature, one that is brim full with chaotic concepts and hyperbole. It is of course a fallacy to say that once a certain place has reached a certain threshold of persons with computers or persons on-line that it is then part of the information society. It is equally untrue to say that once a certain amount of partnerships and collaborations through networking have been achieved that the place is also a part of the IS. However, a combination of the above can go in the right direction to building up a robust and inclusive society in this age of information.

This chapter has sought to better define the information society by separating its mechanistic traits, such as PC penetration, from the more biological traits like increased collaboration and networking. This has enabled me to segregate more properly the information economy from the information society. My work highlighted regions as winners and losers in different areas of measuring development in the information age, but more importantly it made clear the fact that 100% coverage of ICTs across a region does not imply an information society, and therefore interpreting the more mechanistic traits as crucial to developing an information society is short sighted. The case of the Irish regions compared to the RISI regions is most prevalent here.

The Irish success story that has formed the main body of this work can be seen as a booming Information *Economy*, rather than a booming Information *Society*. The

policy approach in Ireland is best described as mechanistic, and market-oriented with little space for human agency. What has happened as a result of this is most development actors in Ireland ranking the more biological traits such as adaptability and learning/ networking as much more important in creating an information society than greater numbers of households with PCs. One of the reasons for this is that it is being recognised that the people with the PCs and Internet connections are mostly young, urban and middle class (itech research, 2001). There is recognition here that top-down market policies will never bring about an information society across Ireland because these approaches are not conducive to the creation of a learning and collaborative environment that will encourage people, regardless of their class or age, to go on-line and thereby decrease the gap between the information-rich and information poor.

Looking at both the RISI and the Irish regions together under the spectrums of ICT usage and collaboration/networking I have highlighted evidence of the existence of one or other in many of the regions. Whether this is enough to consider a region as part of the Information Society is up for debate. However, what needs to be recognised is a symbiosis of the two. Through the creation of networks and increased knowledge diffusion, ICT uptake can only become easier for the regions. Setting out policies that see the relationship the other way around can be likened to 'putting the cart before the horse'. In many ways, while I appreciate the faults of RISI, I see it as a conscious policy effort of placing the horse firmly in front of the cart.

In this chapter I have compared and contrasted the dirigiste approach of RISI with the neo-liberal approach of the Irish regions. In appreciating the end result of these policies I have been better able to appreciate development in the information age, and define the term information society itself. What becomes obvious about developing an information society is that it neither evolves organically, nor is its growth led by the market. The Information Society is, in essence, a social entity, an entity that involves a more humanistic/biological approach by listening to the demands of the people at the local level. By doing this, people begin to see what it is exactly that the information age can offer them, and adapt to it accordingly. For this reason, the dirigiste approach to development in the information age is best at promoting the advancement of the information society.

In looking at the Irish regions, I was able to segregate the information economy from information society. In combination with results from past chapters I have been able to term Ireland an information economy rather than information society. Unlike the information society, the information economy is very much led by the market, by creating the correct market conditions an information economy can boom. The neo-liberal approach of the Irish policy makers did just that, and throughout the 1990s we have seen Ireland become one of the world's leading information economies. But the mistake is made by many to interpret the growth of a high-tech industry or even increased PC penetration as an example of a booming information society. The top-down supply-led nature of Irish policies did little to aid the development of an information society and may even have retarded its growth in Ireland.

What also becomes obvious if we consider both RISI and Irish regions together is the importance of space across the differing scales. As earlier chapters have made clear, there remains a stubborn geography behind economic development in the information age. This chapter has demonstrated that among the less tangible facets of this new age, such as networking, there too remains a distinct geography of uneven development. This may be due to shared geographical characteristics of certain RISI regions enabling them to collaborate better because of their like predicaments regarding industrial and commercial mixes, or it may be a product of the distinct social geography of some fortunate regions such as the Midwest of Ireland where inter-organisational networking is more potent because of the shared sense of duty to creating a better region. This point was made through my interviews and survey work which showed that all Irish regions were aware of the benefits of networking and collaboration between the regions actors, but only some regions could actually set this in motion.

Finally I raise a point that will be explored in greater detail in the final chapter; Sui's (2000) notion of accessibility versus adaptability in the information age. This is central to the argument outlined in this chapter. I have cited regions with a good degree of access to the information age, through their stock of IS assets. I have also highlighted regions better able to adapt to the information age, through their ability to learn, collaborate and build partnership. Neo-liberal policies on both an Irish and EU

level have essentially promoted access, but I see the ethos embodied in RISI as a conscious turn towards adaptability. Both access and adaptability will prove key for success in the Information Age, any policy that can delineate an appropriate mix of both in a certain space will prove a definite step forward.

CHAPTER 9: SUMMARY AND CONCLUSIONS

This work has attempted to address some of the key issues in economic geography through my focus on regional development in the information age. It has been argued that we are living in a world of regions, nowhere more so than in Europe. Changes in production have shifted the emphasis of accumulation to a sub-national scale. The end result of which has seen various spatial territories such as Ile-de-France and London rise in economic terms while the more remote regions like Limousin and the North East of England have fallen further behind.

To say that regional disparities are on the increase is nothing new, indeed the work of Doreen Massey (1984) was pointing this out as much as 20 years ago. But what I have done here is question what has been the impact of moving into the information age on Europe's regions. European policy at a national scale and beyond has become pre-occupied by this very question for the last 20 years. As a result the Commission has funded numerous programmes and projects, the outcomes of which were to create a knowledge intensive Europe, ready to innovate and to lead the world in terms of Information Society Technologies.

To a large extent the money spent by the Commission has not shown much return, and 20 years later we have a European Union that seems to be slipping further behind its main competitors and trading partners and jostling for positions in world rankings with newly industrialised countries from South East Asia. To the dismay of many in Europe, information and innovation did not take-off on the same scale as everywhere else.

The focus here has been on regional development within Europe. The idea behind the original European Economic Community was a Union of the nations of Northwest Europe, however, the European Union we see today is more a Union of regions than of nations. Regional Development policy along with innovation policy has been high on the political agenda in Europe. I have seen evidence in my study of the pursuit of the latter to the detriment of the former, not least in the liberalisation of the European telecommunications industry, which has added to regional disparity across the EU (Gillespie et al, 1999, 2001).

I have used Ireland as a test bed for regional development across the continent. Ireland is a country that has opened itself up to globalisation (much of it at the behest of the European Commission) and created one of the most economically liberalised States in the world. The alleged result of this, according to the IMF (2000) and World Bank (1998) has been the well renowned Celtic-Tiger Phenomenon.

The 'Golden era' of the Irish economic miracle is defined by two traits: the inordinate growth rates in GDP (reaching above 10% per annum in the latter half of the 1990s) and the technological hue to this growth. Throughout the decade the Irish economy was defined under many different labels, from service sector-oriented, high-value added, software development-oriented, to high-tech economy. The figures speak for themselves, and by the end of the 1990s Ireland became the world's leading software exporter (IDA, 2000) (see Chapter five and six, tables 5.2 and figures 6.1 - 6.3).

However rosy the picture was for Ireland in terms of national statistics, once we probe deeper some interesting facts come to light. Not least of these was the over-arching inflation of many of the figures for the high-tech industry by double-counting of foreign multinationals' profits. As O'Hearn (1997) pointed out, the actual figure of Irish growth was hard to decipher because of the distortion of the figures by MNCs counting their profits from all around the world as coming from Ireland in order to take advantage of the low corporation tax of 10% (raised to 12.5% on the 31st of December 2002).

Secondly, as chapter six noted, was the wide divide between foreign and indigenous companies in the high-tech sector. What became obvious here was that the vast majority of figures that made up Irish growth rates came from foreign owned (particularly US owned) companies. Not only that, but the type of work carried out by MNCs in Ireland has also raised a few questions. The State, through the auspices of the IDA, made a conscious effort at attracting high-value added companies to Ireland. At first glance the policy looked successful with a good share of the world's top high-tech companies choosing to locate in Ireland. Again, once we dig beneath the surface, the picture begins to lose its sheen. What became obvious from my research is that

while Ireland seems to have attracted the high-value names, the work going on within these companies for the most part is not high-value. Many of the big companies in Ireland, from Microsoft to Dell, are engaged in low-value production line work. The presence of any significant work in the higher-value added area of Research and Development is virtually non-existent.

The nature of this type of work on-going in MNCs influences their degree of embeddedness in Ireland. Of late we have begun to see the fickle nature of this, with the global economic downturn affecting an 'open' Ireland adversely, with many of the big names, from 3Com to Tellabs shutting down their Irish operations in the last two years. Another result (probably of greater concern) of this lack of embeddedness is the analogous lack of backward linkages with indigenous firms. The creation of such linkages was one of the primary aims behind the policy of bringing in foreign investment. Examples of such backward linkages were indeed prevalent among and between the MNCs, in another effort to reap the rewards of a low corporate tax regime, but examples of linkages between MNCs and indigenous high-tech companies were scarce.

Looking at the geography of the software sector in Ireland gave a greater understanding of how economic activity has taken place across space in the information era. Ireland and the nature of the Irish economy as it is, steeped in information proved to be a perfect test-bed for the geography behind development in the new era. The results of this piece of my work showed that the development was far from uniform. What happened in Ireland, and what could be said to be indicative of the rest of the world was an extremely disparate growth pattern across Ireland. This saw the Dublin and the Mideast regions account for upwards of 75% of all Irish software companies, while the Midlands accounted for a mere 0.6% (see table 6.9).

Ireland lacked regional uniformity prior to the advent of the Celtic Tiger, but the result of the boom was not meant to lead to an increase in this disparity of growth between regions. Ireland paid the price of ignoring regional policy for too long. After nearly forty years absence from the policy agenda, the regional debate returned. This was in recognition of the lack of diffusion of development in Ireland over the 1990s. Bottlenecks and congestion were bringing diseconomies of scale to Dublin, while

towns and villages on the West coast saw continuing depopulation. An inadequate answer came in the form of the National Spatial Strategy, published in 2002, a rehash of old growth centred policies that lacked enough bite to make any real difference.

What happened in Ireland over the 1990s flew in the face of not only the cyber-evangelists like Batty and Toffler, but also the neo-liberals in the IMF and World Bank. The result of embracing the information age was not a uniform development where the use of ICTs and the building of a high-tech sector would transcend the barriers of space. What we have seen in Ireland is not a new age where people are no longer restricted by geography, but a new phase of capitalist development, one where transactions are carried out quicker, to the benefit of the richer and the detriment of the poorer. The information age has not broken down any barriers in Ireland, but has instead created new ones, those of access and adapting to the infrastructure and technology necessary to compete in a global environment.

Another divide that exists in Ireland as a result of its chosen development trajectory is the gap that exists between economy and society with the spread of these new technologies. This has led to much confusion for both politicians and commentators. The 'sound bytes' used by both are plentiful, claiming Ireland as a successful Information Society. Dividing the terms information economy and information society in Ireland led to clearer insights on the nature of Ireland's information society. In terms of the presence of an information economy in Ireland, there are many statistics to prove its existence, be it an information economy with many faults. These are the statistics that have been misconstrued by politicians who use them to claim the presence of an Information Society. While not easy to define itself, an information society can at least be defined by what it is not; an information economy.

Having made use of more social statistics like computer penetration, internet usage in the home, networking and collaboration (as opposed to ICT companies, and software products as a percentage of exports) I have shown Ireland's rather dismal performance in terms of Information Society. For what it is, it too displays the same geographic discrimination as the information economy, leaving regions like the Border, Midlands and West much further behind the leaders of Dublin and the Mideast. In looking at the information society in the softer less statistical terms of networking and collaboration

of actors within the regions, I uncovered a slightly different ordering to the Irish regions. What came out of this was the vibrancy of Midwest and Southwest (RISI) regions of Ireland, in terms of their ability to form trust and create institutional thickness to their regions. There was a process of adaptation ongoing here that placed them in a more favourable position to take advantage of what the information society had to offer. Even this factor of the IS lacked geographic uniformity, and using this new measure is of little comfort to Ireland's less favoured regions which remain much further behind the rest.

I focused on Ireland because of the uniqueness of the Irish experience in the information era. It proved to be an ideal case for understanding the effects of fully embracing and incubating the growth of high-technology industries in the last 15 years. A liberalised Ireland had gone so far down this road that it should prove to be an ideal barometer for the rest of Europe which, according to many of its recent policy decisions, advocate this development trajectory. At the same time, it was a study into how Ireland could learn from Europe. As has been mentioned, regional development policies have been absent from Irish policy making for the past few decades, while regional development has been consistently high on the EU agenda. I used RISI as an example of the Commission's attempt to turn from its neo-liberal policy approach of the past. RISI was picked because of its institutional focus, a key trait of the dirigiste turn in EU policy thinking where intervention through the use of state actors and institutions has replaced the laissez-faire approach in the past.

This I believe contrasted nicely with the laissez-faire approach to regional development in Ireland. The results of RISI were mixed. It cannot be said to have changed the fortunes of many of its participants, yet it is also true that RISI was by no means a failure. Unlike the neo-liberal policies of the past, RISI and its demand side approach did not inflict the IS on its regions in an attempt to increase access to a place that not many people wanted to go. Rather what it did was increase people's ability to adapt so that if they chose to go there, they could.

The case study regions of the Midwest and Southwest of Ireland fitted in perfectly with my work, as they were both Irish regions that were part of RISI. In looking at them and their performance in the new era, many things came to light. First, was their

relative success in both information economy and society scores, at a national average in the former and much above in the latter. Second was the importance of regional governance/autonomy. Both regions have a strong level of regional governance and the presence and remit of Shannon Development also made the Midwest autonomous from some national policies. The sense of identity in both regions pervaded through the social to the economic sphere. With the help of dynamic regional authorities (Southwest Regional Authority) and agencies (Shannon Development), which many of the regional actors held in higher regard than State agencies, both regions have been successful in creating institutional thickness. The result of which was successful partnership building and network creation. Both stand out in an Irish context, and are notable in a RISI context as well.

I am confident that my work has provided an original take on the development of regions in the information age and that I have achieved my aims and provided the answer to the four research questions posed in my introduction (Chapter 1). Firstly, I have shown that while some regions have a new found trajectory as a result of engaging in ICTs (notably the city-regions of Dublin, and to a lesser extent the Midwest and Southwest of Ireland) these are, however, an exception to the rule for many of Europe's LFRs. The information age has not and most likely will not prove the panacea to European regional ills for many of the reasons I have cited. Incentives for high-technology firms to locate in more peripheral areas, such as, lower land and labour costs are outweighed by the constrictions of peripherality, most notably the lack of decent infrastructure, both physical and telecommunications in the case of smaller operations and lack of critical mass in the case of larger ones.

In response to my second research question I have identified throughout the course of this work two distinct approaches to development in the information age: the market-led and the institutional. The former has been in place across Europe and Ireland over a longer period of time and may therefore be the easier to appraise, the latter is more recent and what I see as a direct response to re-occurring anonomalies of the former. I have adequately demonstrated the effect of market-led policies on regions in Europe and provided evidence of them resulting in greater divergence between the richer and poorer regions. The effects of the institutional/dirigiste approach may be too early to tell, but results are positive at the local-level and in terms of developing an

information society. However, with regards it creating more robustly competitive regions, the results are not so positive.

My third question sought to uncover the policies that aided the growth of the Celtic Tiger and the truth behind the extraordinary growth figures of 1990s Ireland. Chapters five through seven explicitly laid out the development path that chosen by Ireland, showing how the country made a conscious effort to open itself up and target inward-investment as well as concentrate on creating a competitive advantage in high-tech industries. The result of the tigerish growth that Ireland experienced in the 1990s and as chapter 6 pointed out, the software industry was seen as epitomising this growth. However, a more in-depth look at both the growth figures and the growth industries highlights a darker side to the tiger. Irish growth figures were exacerbated by double counting and the practice of multinational's repatriating their profits. The software industry was one of the prime perpetrators, and this in turn inflated growth figures for the industry. On top of this evidence I highlighted the dualistic nature of the industry; one with an indigenous sector dwarfed by foreign owned companies who, for the greater part, were involved in lower-value added production and contributing little by way of backward linkages or high-level jobs to their localities. Socially, the distribution of wealth in Ireland was more biased and uneven than ever seen before; politically, the problems came down to the regional level because the economic benefits of the Celtic Tiger were so spatially unbalanced.

Finally the above answers and the sections that follow provide an answer to my fourth question regarding better definition of development in the information age. The case of Ireland has provided an excellent example of the effects of a market-led approach to development in the information age as have many of the EU IST policies up to the mid-1990s, when these are compared to the performance of regions pursuing the dirigiste approach we are provided with a clearer definition of what development in the information age can be. What I have done is segregate the two approaches and show how they imply very different results for developing regions in the information age. The following sections are an attempt to clarify my results through more in-depth explanation.

Theoretical Explanations

The theory that has informed my work is both wide and comprehensive. Chapter two, my literature review, demonstrated the diversity of theoretical debates on development in the information age. It is hoped that my contribution has added to this stock of knowledge by contesting and complementing various issues that are at stake. My standpoint is one that is critical of neo-liberal thinking, which manifests itself as much in my policy critique as it does in my theoretical one.

In the information age there is widespread agreement among social scientists that capitalist economies are undergoing fundamental changes, which could be interpreted as a shift to a new form of capitalist development. Many different theories have attempted to rationalise this shift, but by far the most influential has been the flexibility thesis. This asserts that the shift can explained as the transition from Fordist to a more flexible economic system. The thesis contains two main theories: flexible specialisation theory and flexible accumulation theory. The former can be seen in the work of Piore and Sabel (1984) and the latter derives more from the work of the French regulation school of thought which has been furthered in the wiritings of Michael Storper and Alan Scott. The flexibility thesis has largely been the realm of urban and regional researchers as well as economic and social theorists, because it contains a middle range perspective, mainly focused on spatial contexts and how to relate economic restructuring with spatial restructuring. One of the main thrusts of the argument is the idea of new industrial districts as models of indigenous regional development.

There has been a reaction against some of the more categorical claims made concerning the pervasiveness, significance, ambiguities in the concept of flexibility, the frameworks of binary oppositions and success of the flexibility model, by writers like Sayer (1996) and Amin and Robins (1990). For the past 20 years the "flexibility debate" has raged in social science in general.

These ideas of industrial districts, clusters and flexibility were thrown together in Irish Policy making (O'Gráda, 1997). The above theorists have raised doubts about the

implications of pursuing these policies. Along with Lovering (1999) I would argue that the 'flexi-theorists' misunderstand the nature of those processes, and that it is a misunderstanding that is rooted in a theoretical framework characterised by structural-functionalism and historical teleologism. Certain tendencies in the present period are projected forward as the paradigm for a future regime of accumulation. Critics see the process as far less determinate and as the regulation perspective makes clear, the resolution of the present crisis could take numerous forms.

My work has highlighted this dichotomy in the Irish scene and my contribution to the theoretical debate here falls between two stools. The industrial districts and Foreign Direct Investment (FDI) approach in Ireland pursued by the IDA, has been heralded by many politicians as a great success. Examination of the types of companies that have set up in these districts show that such a diagnosis is somewhat of an over statement. Low-value added basic manufacturing industries with 'loose feet' have had an impact on the Irish economy, though their repatriation of profits to their country of origin has exaggerated the impact of their presence. Not only that, but while the theorists that advocate this approach claim that milieu and linkage formation will be the main benefit, my work has shown few examples of this occurring in reality.

That said the impact in terms of output and export figures on a national scale have made up a massive proportion of what has been termed the Celtic Tiger phenomenon. Looking at the indigenous side of Irish high-tech industry, theories explaining the impacts of FDI such as those of Dicken (1998) and the industrial districts approach do not go all the way in explaining what is happening here. The existence of the Irish indigenous industry is better explained by the 'softer' theories of Amin and Thrift (1995) and Cooke and Morgan (1998). Ideas of learning with the aid of state animateurs in the form of Enterprise Ireland and some regional development agencies (Shannon Development) are cited by many indigenous companies as the keys to competitiveness in the new economy. What is happening here is more akin to the institutional perspective which echoes the bloodless categories of 'state' and 'market' in favour of a more historically-attuned theoretical approach in which the key issues are the quality of the institutional networks which mediate information exchange and knowledge-creation. Along with the capacity for collective action, the potential for interactive learning and the efficacy of voice mechanisms are seen as important.

The harder/growth pole theorists better explain the Tigerish growth of the Irish software industry, but I would argue that the softer/institutionalist approach better explains the indigenous industry, an industry which, while miniscule in comparison to its foreign neighbours has a higher proportion of R&D and better accounts for what production needs to be in the information age.

Policy Explanations

My policy critique followed much the same line of inquiry as above. I identified the predominant policy response to the information society in Europe as essentially neo-liberalist. The market-led policy of Europe has, by its very nature advocated supply-led policies to help regions to compete in the Information age. At the heart of these policies have been issues of accessibility as opposed to adaptability, where supply-led initiatives sought to increase the demand for new technologies by creating a supply.

The end result of the neo-liberal approach has seen an increase in the digital divide both in terms of space and class. The gap between Europe's information rich and information poor is on the increase, as is the gap between its regions in terms of information society assets (Eurostat, 2002). The use of this kind of policy response has been short-sighted and in terms of regional development, the Commission's policies have succumbed to market-led ideologies. The liberalisation of the telecoms market was the first step in creating an uneven playing field for European regions in the information age. As a result we now see little or no provision in Europe's less favoured regions, thus making it even more difficult for them to compete in the information age.

Unlike previous EU regional development programmes, which were heavily biased towards supply-side initiatives and infrastructural schemes, the new generation of regional policies such as RISI represent a radical departure in two ways. First, they address themselves to the demand-side problems of local actors and, second, they aim to tackle the problems of institutional inertia in the LFRs by sponsoring a new, consensus-based process of interactive learning within and between the public and private sectors (Morgan, 1997). Elsewhere it has been argued that these new regional innovation policies signal a serious attempt, on the part of policy-makers and practitioners alike, to address the problems which have been identified in the

institutional perspective on regional development (Morgan and Nauwelaers, 1999). In particular these new policies seek to engage with the most obdurate institutional problems (like voice-formation, co-operation and collective action) which have exercised a long line of developmental theorists from Albert Hirschman onwards.

Irish policies of economic development have also been steeped in the neo-classical tradition. Since 1958 and the publication of the Whitaker Report, which advocated liberalisation, the State fervently supported free-market policies which saw Ireland become one of the world's most open economies (see Chapter 7). Ireland looked towards foreign direct investment as a key driver for its economy. Through the use of very attractive industrial packages, Ireland managed to attract companies from abroad, some of which were the biggest names in software.

The result of these policies was a very uneven spread of development across the State. The less favoured regions in Ireland failed to benefit, as the MNCs chose the country's largest cities as development sites. The rationale was simple economics; Ireland's less favoured regions lacked the critical mass to support these industries. But, while the Irish regions failed to develop, the city region of Dublin was facing breaking point through congestion and increases in the price of properties and labour. The Irish State had been fore-warned, but still followed the orthodoxy of laissez-faire; more recent policy documents like the National Spatial Strategy do not suggest any major change in the policy approach in the near future.

If the policies of the Irish State were liberal, they also had a definite underlying agenda which was to take advantage of the booming electronics and software industries. As already discussed the policy could be deemed as successful on the front of attracting the industry's big names to Ireland, but less successful in terms of achieving the policy outcomes of creating an embedded foreign multinational sector.

In terms of polices directed at the information society itself, these too were inherently liberal and supply-led; one of the best examples of this was the Ennis Information Age Town Initiative, supported by the Irish Government with and through the telecoms provider, Telecom Eireann (now Eircom). This initiative was an innovative project undertaken in 1998, a project that gained media coverage the world over. The idea was to completely network the town of Ennis (located in the Midwest region with

a population 20,000), subsidise PCs and give free access to the Internet for households, businesses and public services. The Internet was used as the tangible façade for the information age in Ennis; it was the buzzword that was highlighted in all the brochures. The promise was that the town would no longer be bounded by the restrictions of the peripherality of the west coast of Ireland. Once it became an information age town it would no longer be limited by physical space, it would be part of a cyberspace. There was promise of increased inward investment to absorb the information rich workers, Ennis could use the Internet to publicise itself on a world stage. Four years on the talk is of 'unrealistic expectations' and 'what good is broadband if you can't get to Dublin in less than four hours' (Independent Ennis household survey). In addition some of its flagship projects, such as Ennis Information Age Services Ltd are struggling to survive. The internet consultancy received €1 million from the project, but in 2002 recorded accumulated losses of €893,400 and has been forced to cut its staff (Irish Independent, April, 2004). Moreover, in some accounts it was deemed a marketing ploy by a state telecoms provider about to turn private.

> "According to the Press and the literature it was an initiative to help Ireland engage with the information society - in reality it was a marketing initiative by the telecommunications company"
>
> R&D officer with the Ennis information age group

The Ennis Information Age town is proof of the result of supply-led initiatives. Ireland had put its faith in the free market (with the noted exception of a low corporate tax rate) to aid the development of the IS. What Ireland ended up with was a fragmented version of an information society, one that was neither geographically nor socially evenly distributed.

I made use of RISI as a different approach to the market-led policies and attempted to show how it sought to create interactive learning networks in its regions in order to create demand for the IS, through enhancing the region's ability to adapt to the IS. To some degree the RISI regions were successful here, and through my focus on the Midwest and Southwest regions of Ireland I demonstrated that such networks can be

aided with judicious public policy thus enabling the regions to better compete in the information age.

Development in the Information Age: Accessibility versus Adaptability

Theoretical speculations on the impacts of the Internet-led telematic revolution are rampant in the literature. Arguments range from the borderless world and the end of nation states (Ohmae 1990, 1995), space-time compression and distanciation (Harvey 1996), and the death of distance (Cairncross 1997), to the anywhere- anytime-anything paradigm for interpreting access to various social, economic, and cultural aspects of society (Mitchell 1995). And yet rarely are these assertions supported by convincing empirical evidence because of the lack of relevant data and because of the enormous conceptual complexities of measuring access and accessibility in the information age. By shifting the perspective from accessibility to adaptability, through use of different data, my hope is that I have shed light on the emerging geographic patterns in the new information age.

Human thinking and cognitive abilities are inherently metaphorical, and geographers have paid increasing attention to the role of metaphors in geographic theories and models (Sui, 2000a). Generally speaking, most models in social sciences are developed according to either a physical/mechanistic metaphor or a biological/ organic metaphor. The root metaphor behind the various measures of accessibility is a mechanistic one, and the concept of adaptability is motivated by a biological metaphor. To shift the focus of research from accessibility to adaptability necessitates not only a change of metaphors but also different policy prescriptions about the geography of information societies (ibid.).

The mechanistic metaphor embedded in various measurements of accessibility has a built-in deterministic and ahistorical ontology. The world is conceptualised more or less like a gigantic machine, composed of parts (bounded regions) and geography is about the interaction of those parts. Accessibility measures the reachability of various

parts by people. All aspects of human life are determined and represented by the calculus of variation, and human agents have no choice but to behave in accordance with physical laws such as the laws of least effort. Such a worldview is ahistorical: reality is theorised in logical time, not historical time. Motion is completely reversible and gives rise to no qualitative changes (Barnes, 1997).

The epistemology behind a mechanistic metaphor separates the object and subject and is therefore inherently reductionist. The mechanistic approach reduces the complexity of the real world into smaller components in order to facilitate analytical treatment. Implicit in the various accessibility measurements is the rational individual devoid of irrational behaviour. Accessibility is operationalised predominantly from the perspective of supply-side economics (Shen, 1998). The mechanistic metaphor also imposes a strong sense of teleology to the system. The purpose of the system is to optimise or maximise over everybody's collective objective function essentially maximising utility. Despite its analytical elegance and contributions to the development of neoclassical economic theories, the mechanistic metaphor only presents a very partial, limited view of reality (Mirowski, 1994).

Through looking at regional development in the information age in Ireland we can appreciate the above critique of the mechanistic approach. The supply-side prescriptive nature of policies pursued in Ireland reduced the complexity of the Irish economy and perceived it as a simple set of elemental components. One of these components was the high-tech industry which was subjected to analytical treatment by judicious policy making such as packages to attract inward investment. Such packages were teleological in their treatment of the MNCs, assuming that their presence alone would stimulate indigenous production in Ireland. Also in terms of the information society, the prescriptive policy approach has been somewhat short-sighted in considering a certain percentage of the population having access to the internet as constituting a vibrant information society in Ireland. Chapters six, seven and eight have provided a great deal of evidence that the mechanistic methods adopted by Irish policy makers have had a somewhat blinkered view of the subject and of reality.

The recent round of evolutionary thinking in general and the recent development of evolutionary economics in particular (Hodgson, 1993; England, 1994; Nelson, 1995) inspired the idea of adaptability. The root metaphor of adaptability is a biological one. Its ontology rejects the notion of full mathematical determinacy. Instead, the world is assumed to be a result of the interplay between chance and necessity. Reality is not only path-dependent but also non-linear in its dynamics – small changes can provoke wider reverberations throughout the entire system. Its epistemology denies the understanding of the whole by analysing its parts. The world is conceptualised as composed of an intertwined, complicated web, and geography is about the evolution (the dynamics) of the web as manifested by the interaction among each strand in the web. The resultant behaviour and spontaneous growth (order out of chaos) should be treated as the norm. The adaptability perspective assumes no teleology – the wider system is not necessarily improving or pursuing some ultimate goal of perfectibility. The best one can expect is a temporary sub-optimal result of a constantly evolving, unpredictable process.

In evaluating RISI and the dirigiste approach it embodies we have seen that it has had a much wider perception of reality. Rather than reducing the world into components in order to facilitate analytical treatment, the dirigiste approach understands the whole by analysing the parts and RISI shows a better appreciation of the information society by placing importance on actors and tools that embody it. This has been integral to the bottom-up, demand-led approach of RISI. This approach better encompasses the path dependent nature of the reality of development in the information age. Indeed the complex nature of development in the new age is better served by the inclusion of actors in networks of collaboration and learning. There is a sense of teleonomy to the biological metaphor in the dirigiste approach which does not interpret developing an information society as an end point, but as a continuing process of adapting.

Focusing on the adaptability perspective may play into the hands of Markusen (1999) and her critique of fuzzy concepts. With that in mind I believe that a sole focus on issues of accessibility would not have been sufficient for looking at development in the information age. While issues such as PC penetration lack fuzzy edges, they do not sufficiently explain the emerging information society. Looking at learning networks may lack the clarity of IS statistics but identifying them on the regional case

study level gives them a sufficient grounding, so that their interpretation can be uniform.

Regions are evolving from production systems developed in the industrial age into massive learning systems facilitated by both technical and social networks in the knowledge economy (Petchell, 1993; Lundvall and Johnson 1994). Understanding how a region learns will be one of the most important challenges faced by geographers in the information age (Jin and Stough 1998). Preliminary results indicate that the emerging geography of the information age will be differentiated increasingly by a region's learning (adaptive) capabilities (Florida 1995, Asheim 1996).

To better understand the geography of the emerging information society, we must liberate ourselves from the tyranny of mechanistic conceptualisations of reality (Sui, 2000b). Development in the information age is obviously a complex adaptive nonlinear network. Conventional conceptualisations of reality according to deterministic, reductionistic, ahistorical, and teleological assumptions, may be sufficient for the industrial age, but are incapable of capturing the unpredictable, interconnected, and constantly evolving new information age.

Considerations and further questions

The conclusions listed above lack a great deal of semblance to those I would have envisaged at the outset of this project. The fact that geographic inequalities were on the increase in the information age and the much heralded death of distance had not occurred may have been predicted but were necessary to prove. The Regional Information Society Initiative was demonstrative of a change in EU thinking, but my work sought to question how the new policy could change the new reality. The Irish economy over the 1990s was a huge success, much of which was put down to its ability to engage with information age technologies, but the impacts of the success geographically, economically, and socially needed to be shown. In all three areas I was surprised; by the reconstitution of geometries of flow and exclusion brought about by the proliferation of ICTs, by the fact that RISI had in essence meant a whole new theoretical approach to development in Europe, and how divisive Ireland's new found wealth had proved economically, socially and especially spatially.

At the outset, my proposed approach and methods were slightly different but were forced to change because of some of the issues that had arisen in the course of my research. My choice of four case study regions in Ireland was rationalised as a comparison between the two members of RISI (Southwest and Midwest) and two non-RISI regions (Midlands and West) to enable the contrasting of policy-on (the former) versus policy-off (the latter). The idea was to test the performance of the RISI regions which espoused the views of bottom-up, demand-led development against the non-RISI regions which were following the national agenda of supply-led development.

However, this distinction did not hold in reality. After carrying out my fieldwork it became obvious that the supposed policy-off regions, had in actual fact attempted the policy-on approach. Indeed, there were numerous examples of policies pursued in the non-RISI regions which were very much bottom-up development supported by actor network collaboration. I had originally conceived of this being solely the domain of the RISI regions, being part of the 'experimental' initiative I thought that they were the only Irish regions that were privy to the new 'institutional turn' in development thinking. The reality was somewhat different, by the time interviews were carried out it was obvious that all regional authorities in the case study regions were well versed in the dirigiste approach. Therefore, language such as 'demand-led', 'local user needs' and 'bottom-up' is widespread throughout all Irish regions. What had obviously occurred was the shifting of theory to policy at a much quicker rate than I had anticipated which put paid to my policy-on/policy-off comparisons. In the end what I actually compared were the same sets of regions, but with the Midwest and Southwest demonstrative of regions where the shift had occurred from policy to reality.

Related to this was the comparison between the bottom-up and top-down approaches. There is considerable irony in the fact that the bottom-up approach that we see Irish regions attempting to adapt has actually come from the top-down via a filtration process from Brussels. While State development agencies have since begun to herald the benefits of this approach to regional development, the manner in which Irish regions became familiar with it is interesting. The process whereby a development theory filters from Brussels to the regions, bypassing the national policy can be seen

as lending credence to 'hollowing-out of the State' theory, according to which development decisions are increasingly being made at the local and supranational levels (Storper, 1997).

Finally, one theme that ran through my research in a way that could only be recognised through hindsight is dualism. The dualistic nature of the policy I scrutinised; market-led versus demand-led, the dualistic nature of the theory that informed it; neo-classical versus institutionalist, and the resultant dual natures of development in the information age; information economy versus information society. The latter is an important and relatively new delineation in segregating the economy from society in the information age. The differentiation helps better explain the different development trajectories of both Irish and RISI regions, and applying the label information economy to Ireland has been proved to be much more adequate than information society, which can now be seen as a misinterpretation of the Irish experience.

What is also interesting is how the former dualisms informed that of information economy and society, where we see neo-classical theory has directly influenced market-led policy, which in turn bought about a more economically attuned type of development. Institutionalist theory founded the basis for dirigiste policies, which in turn brought about a more socially attuned type of development. In the information age, this has made for the two distinct modes of production – information economy and information society, both of which involve two different forms of benefit. An information economy lays the lines of accessibility open to aid the flows of the free market while an information society, through education and informing, enables adaptability which aids social development in the information age.

I believe this thesis has answered many questions regarding development in the information age, but like all good research it also creates a series of other unanswered questions. Firstly, with respect to Ireland, could it have chosen a different and equally as economically beneficial development path? Secondly, looking at RISI, owing to its experimental nature, what was the viability of this approach? Thirdly how will the distinction between information economy and information society change perceptions of development in the information age?

Looking at Ireland and the economic boom it enjoyed over the 1990s, it is difficult to say that it should have been any different. However, with the benefit of hindsight we see the weaknesses behind the GDP growth figures in Ireland. There can be little doubting that Ireland should have chosen to pursue competitive advantage in high-tech industries owing to the highly qualified nature of the population and the coinciding world-wide boom the industry experienced. But questions have to be asked about the type of policies used in Ireland to gain a foothold in the industry. The supply-led, low corporation tax approach might have proved to be somewhat short-sighted and demonstrative of Ireland, rather than being a major player, simply riding the wave of the technology boom in the 1990s.

For RISI and the regions involved in the initiative, the experience was, on the whole, a positive one. However, in terms of creating dynamic and competitive regions in the information age that have significantly changed their economic standing vis-à-vis the rest of European regions, the programme was largely unsuccessful. That said, it should also be noted that the initiative was small and experimental, it was a decidedly new approach to EU development programmes which flew in the face of those that went before. The bottom-up, demand–led nature of the programme was not seen in Europe prior to this programme, but it can be heralded as the start of a significant shift in thinking, that has influenced not only the policy makers in Brussels, but those in the nation-states of Europe.

The new distinction between the Information Economy and Information Society will also prove significant. Both involve very different, but no less valuable benefits. What can be done with this distinction is a better targeting of how and what it is that needs to be developed in the information age. Whether the approach of Ireland, one that has effectively created an information economy prior to the information society is one that countries may wish to emulate or whether they chose the appreciably different and somewhat more stable approach of creating an information society before information economy can be an easier choice by the identification of the separate policies that are necessary for both. This work has shown the effects and results of both these diametrically opposed approaches, and while it may be socially more just to follow the dirigiste approach which will bring with it a more concrete base to a more

spatially and socially equal information age, the unfortunate truth is that economically and especially politically policy makers will lean to the more liberal approach which brings with it a reinstatement of the global geometries of flow, incorporation and exclusion where only the few benefit from the endless possibilities of new technologies.

Appendix 1A: Survey sent to Irish Regional Authorities

Questionnaire to the Eight Regional Authorities of Ireland

Name:

_____

Address:

_____

_____

Contact Details:

_____

_____

Organisation Type:

_____

Questionnaire Number: RAA001

NB. Unless otherwise stated when I refer to the region I am referring to the Regional Authority Area as defined in Section 43 of the Local Government Act 1991. These are the eight regional authority areas (NUTS 3) into which the state is divided.

Box. 1 LGA 1991 Section 43
Box. 2 Blurb about RISI

Section 1. Defining the Irish region

Question 1. What impact has the Local Government Act 1991, Section 43 (See Box 1.) had on your region, In terms of: *(The scale is from 5 to 1, In this case a 5 would signify that the impact has been very positive, while a 1 would imply that the impact has been very negative. 3 would signify that there has been no impact)*

A. Increased legislative autonomy	5	4	3	2	1
B. Increased financial autonomy	5	4	3	2	1
C. Increased implementation autonomy	5	4	3	2	1
D. Increased appreciation and use of local knowledge	5	4	3	2	1
E. Increased networking among regional / local actors	5	4	3	2	1

Question 2. How positive has the setting up of an EU Operational Committee in your region been for your region's development? *(As above, 5 being very positive, 1 being very negative, 3 implying no change)*

5 4 3 2 1

Question 3. What effects has the 1992 Culliton Report and its suggestions had on your region, do you think the impact has been different for different regions?

_____

Question 4. Of the two different scales NUTS 2 (i.e. BMW region) NUTS 3 (i.e. Border region) which do you think is most appropriate for dealing with the following issues:

	NUTS 2	NUTS 3
A. Promoting inward investment	Yes/No	Yes/No
B. Creating clusters of innovative activity	Yes/No	Yes/No
C. Promoting the information society	Yes/No	Yes/No
D. Land use planning	Yes/No	Yes/No
E. Creating a regional strategy plan	Yes/No	Yes/No
F. Making legislative decisions	Yes/No	Yes/No

Question 5. Do you think that **regional authority areas (NUTS 3)** have enough political autonomy to act on major developmental issues? (Major development issues would imply serious constraints to a regions development, such as unemployment and low educational attainment – the question asks if you think that your regional authority can act on them?) *(Again on a scale of 5 to 1, choosing 5 would imply that you believe RAAs have enough autonomy to deal with most regional issues, choosing 1 would imply that they have very little)*

5 4 3 2 1

Question 6. Do you think that **regional assemblies (NUTS 2)** have enough political autonomy to act on major developmental issues? (As above) *(Again on a scale of 5 to 1, choosing 5 would imply that you believe assembly region have enough autonomy to deal with most regional issues, choosing 1 would imply that they have very little)*

5 4 3 2 1

Question 7. How much does the bigger assembly region (NUTS 2) of which you are part influence what you do at a regional authority level? *(Here a 5 would imply that what is done at the NUTS 2 level have a very positive effect on your region, 1 would be very negative and 3 would imply no influence at all)*

5 4 3 2 1

Question 8. How much does the national government (and its political powers) influence what you do at the regional authority level? *(As above)*

5 4 3 2 1

Question 9. How much does Brussels (and the political powers of the EU) influence what you do at a regional authority level? *(As above)*

5 4 3 2 1

Question 10. Please rank the following three in terms of influence on the actions you take at a regional level: *(Allocate 1 to the level that has the most influence on what you do, and 3 to the one that has the least).*

A. Regional Assembly (NUTS 2) [ ]
B. National Level (Dublin) [ ]
C. European Level (Brussels) [ ]

Briefly explain why you chose the above rankings

Section 2. The Celtic-Tiger phenomenon

Question 11. Considering the growth of the Irish economy throughout the 1990s (from 4.4% increase in GDP in 1992, to 10% increase in 2000) to what extent has your region performed at the national level? *(Here 5 would imply that your region has enjoyed growth rates much higher than the national average, 3 would signify your performance as equal to the national average, while 1 would imply that your performance has been considerably below the national average)*

5 4 3 2 1

Question 12. Over the last 15 years we have witnessed a significant increase in the software industry across the country, do you think your region has had its 'fair share' of this increase? *(As above)*

5 4 3 2 1

Question 13. Of the software presence in your region at the moment would you characterise it as primarily,

A. Indigenous [ ]
B. Foreign owned [ ]

Could you estimate the importance of one over the other *(As in percentage terms, i.e. 70% foreign owned, 30% indigenous)*

Question 14. Which of the following are of the most importance to your region? *(Please rank with 1 for the most important and 3 for the least)*

A. Low Value added software manufacturing [ ]
B. High Value added software manufacturing [ ]
C. High grade software research and development [ ]

Please attempt to show their relative weights in percentage terms

Question 15. Is the software presence in your region uniform, or does it show signs of agglomeration / concentration in particular parts of the region? If yes, where and why?

Question 16. Which type of software industries tend to agglomerate in particular parts of your region?

A. Low Value added manufacturing [ ]
B. High Value added manufacturing [ ]
C. Other (Specify) _____ [ ]

If yes, where and why?

Question 17. Do you feel any closer to being an active participant of the information revolution and the burgeoning Information Society? How does this manifest itself in terms of the following *(Consider the following against a national average of 3 with 5 implying your region is considerably above and 1 considerably below)*

A. Increased access to telephony	5	4	3	2	1
B. Increased broadband access	5	4	3	2	1
C. Increased awareness of the Information Society	5	4	3	2	1
D. Increased investment in knowledge production	5	4	3	2	1
E. Increased networking of the region's actors	5	4	3	2	1
F. Increased Personal Computer penetration	5	4	3	2	1
G. Increased the number of persons on-line	5	4	3	2	1
H. Increased employment	5	4	3	2	1
I. Increased number of information workers (by which I mean workers working I hi-tech industries and services)	5	4	3	2	1
J. Increased education	5	4	3	2	1

Question 18. Do you think that there has been increase in regional polarisation as a result of the Celtic Tiger phenomenon? *(By polarisation I mean that some regions are growing at a much faster rate then others, the result of which is lending to an increasing gap between the richer and the poorer regions)* Do you?

A. Agree strongly [ ]
B. Agree [ ]
C. Don't know [ ]
D. Disagree [ ]
E. Disagree strongly [ ]

Question 19. What are the prime reasons that you believe have rendered your region better/worse off over the past 15 years? (e.g. Structural characteristics of your region's economy, regional politics, national or EU politics)

Section 3. Regional and Information Society Initiatives

Question 20. Are there (or have there been) any regional initiatives ongoing in your region that attempt to combat increased differences between Irish regions? If yes please list them by date starting with the most recent

Question 21. Are there (or have there been) any national initiatives ongoing in your region that attempt to combat increased differences between Irish regions? If yes please list them by date starting with the most recent

Question 22. Have any initiatives been implemented to promote the Information Society on the regional level? YES NO

Question 23. If yes, have these been regional domestic or European?
A. Regional
B. Domestic [ ]

C. European [ ]
D. Combination [ ]

Please List

_____

_____

_____

_____

_____

Question 24. If regional have these been intended to: *(Again 5 being the highest and 1 the lowest)*

A. Promote the awareness of the importance of IS and knowledge in the region 5 4 3 2 1
B. Promote inter-organisational interaction 5 4 3 2 1
C. Promote the region's primary institutions 5 4 3 2 1
D. Promote learning and knowledge creation 5 4 3 2 1

E. Job creation 5 4 3 2 1
F. Create links between different actors in the region 5 4 3 2 1
G. Create a critical mass in the region 5 4 3 2 1
H. Create innovative milieu in the region 5 4 3 2 1
I. Create trust between actors 5 4 3 2 1
J. Cost effectiveness 5 4 3 2 1

Question 25. If domestic have these been intended to: *(Again 5 being the highest and 1 the lowest)*

K. Promote the awareness of the importance of IS and knowledge in the region 5 4 3 2 1
L. Promote inter-organisational interaction 5 4 3 2 1
M. Promote the region's primary institutions 5 4 3 2 1
N. Promote learning and knowledge creation 5 4 3 2 1

O. Job creation 5 4 3 2 1
P. Create links between different actors in the region 5 4 3 2 1
Q. Create a critical mass in the region 5 4 3 2 1
R. Create innovative milieu in the region 5 4 3 2 1
S. Create trust between actors 5 4 3 2 1
T. Cost effectiveness 5 4 3 2 1

Question 26. If European please rate, in terms of: *(Again 5 being the highest and 1 the lowest)*

A. Promote the awareness of the importance of IS and knowledge in the region 5 4 3 2 1
B. Promote inter-organisational interaction 5 4 3 2 1
C. Promote the region's primary institutions 5 4 3 2 1

D. Promote learning and knowledge creation	5	4	3	2	1
E. Job creation	5	4	3	2	1
F. Create links between different actors in the region	5	4	3	2	1
G. Create a critical mass in the region	5	4	3	2	1
H. Create innovative milieu in the region	5	4	3	2	1
I. Create trust between actors	5	4	3	2	1
J. Cost effectiveness	5	4	3	2	1

Questions 27. Have you heard of Regional Information Society Initiative (RISI) (its predecessor IRISI and follow-up eris@)? (see Box 2.) YES NO

Question 28. Have you ever put in a bid to become part of RISI? YES NO
If yes, at which stage?
A. IRISI [ ]
B. RISI [ ]
C. Eris@ [ ]

Was your bid successful for any? YES NO
If yes, which _____

Question 29. Do you think that the kinds of policies enshrined in RISI (see Box 2) could be of benefit to your region? YES NO

Question 30. Have any other initiatives that you have been involved in sought to do the same? YES NO

Question 31. Would you spend more time on initiatives (of equal funding) from Dublin rather than Brussels? YES NO

Section 4. Regional Issues

Question 32. Is your regional developmental path wholly dominated by your national government? *(Here 5 would imply it is wholly dominated, while 1 would imply it has very little influence)*

5 4 3 2 1

Question 33. What has the relative impact been of EU contributions to the development of your region?
A. Your State's contribution has been larger than that of the EU YES NO
B. Your region's contribution has been larger than that of the EU YES NO

Question 34. In your opinion, which institutions/organisations are key to promoting development in your region?

_____
_____
_____
_____
_____

Question 35. On which of the following sectors is your region most dependent? *(Please rank the following with 1 for the sector on which your region is most dependent and 7 for the region on which you are least dependent)*

1. Hi-tech Industry [ ]
2. Low-tech Industry [ ]
3. Tourism [ ]
4. Retail [ ]
5. Finance/Banking [ ]
6. Consultancy [ ]
7. Education [ ]

Question 36. From which of these sectors would consider will contribute the most to your region's economic development?

Question 37. Which sectors look most likely to benefit from the Information Society?

Question 38. Briefly describe why promoting the Information Society is important to your region? As in how do you see the benefits of the Information Society manifesting themselves in your region?

Question 39. Of the below please rank the sets of Information Society / Economy that you see as best able to help your region develop. *(1 being the most important to you and 6 being the least important)*

1. A region with a very high Personal Computer penetration [ ]
2. A region with broadband access [ ]
3. A region with significantly high computer literacy [ ]
4. A region with a significant amount of employees in the hi-tech sector [ ]
5. A region with a high proportion of low value added computer manufacturing offering a significant amount of employment [ ]
6. A region with research and development orientated software companies offering a relatively small number of jobs [ ]

Question 40. How dependent is your region on inward foreign direct investment (FDI)? *(On a scale of 1 to 5 please indicate how dependent you think your region is on FDI, where 5 is the most dependent and 1 is the least dependent)*

5 4 3 2 1

Question 41. List the particular sectors of the economy where Foreign Direct Investment (FDI) is most important. *(Some sectors receive more FDI than others, for instance the manufacturing of computer components might receive more than does the dairy production. Please list the sectors of your economy that are most dependent on FDI)*

Question 42. What makes your region attractive to FDI, rank the following: *(please rank the following, with 1 assigned to that which makes your region most attractive and 12 to that which is least appealing about your region)*

1. Tax concessions [ ]
2. Grant aid from the EU [ ]
3. Grant aid from the State [ ]
4. Grant aid from your region [ ]
5. Land prices [ ]
6. Labour Prices [ ]
7. Skilled Labour [ ]
8. Proximity to a major market [ ]
9. To reap the benefits of economies of scale – one type of company tends to conglomerate in your region. [ ]
10. The structural fund objective status of your region [ ]
11. Telecommunications Infrastructure [ ]
12. Physical Infrastructure [ ]

Question 43. How do you see your region being treated and developing post 2006? -

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Thank you very much for the time taken in filling this in. A speedy reply would very much be appreciated, if you could return this in the enclosed envelope (with stamp coupon) by the 31st of July, I would be very grateful. If you have any queries, please do no hesitate to contact me

Appendix 1B: Survey sent to RISI regions

Questionnaire to the RISI regions

Name:

Address:

Contact Details:

Organisation Type:

Questionnaire Number: RIS001

As part of my PhD thesis on regional development I am looking at the Regional Information Society Initiative (RISI) and how the 'experimental thinking in Article 10 of the European Regional Development Fund reflects a change in regional policy formation. Many of the following questions are asked along these lines. Of note especially are the goals/objectives of the initiative which include:

- A bottom-up development response
- An inclusive approach representing all social groups in the region
- Building partnerships and establishing consensus among key actors in the region
- The development of new forms of networking and collaborating
- Raising awareness, partnership formation and consensus building that would bring about organisational learning and change
- A common approach among participating regions to help them benefit from inter-regional networking and mutual learning

As member regions of this initiative I hope that you will be able to inform me as to how you found working on it, and the consequential benefits or otherwise to your region

Section 1:RISI and other regional / information society initiatives (past and present)

Question 1. How would you rate RISI in terms of the following? The timescale for consideration is prior to the start date to the present day.

(The scale is from 5 (very positive) to 1(very negative) while 3 would imply that RISI made no impact in your region.)

A. Increasing inter-organisational networking	5	4	3	2	1
B. Increasing Job Creation	5	4	3	2	1
C. Increasing Information Sharing / Acquisition	5	4	3	2	1
D. Helping Regional Development	5	4	3	2	1
E. Helping to promote the Information Society	5	4	3	2	1
F. Creating stronger bonds between indigenous organisations	5	4	3	2	1
G. Creating stronger links between indigenous firms and foreign firms	5	4	3	2	1
H. Helping to promote the region nationally and internationally	5	4	3	2	1
I. The creation of a critical mass or cluster of innovative milieu	5	4	3	2	1
J. Increasing inward investment into the region	5	4	3	2	1
K. Generating greater trust between key actors	5	4	3	2	1
L. Creating a better understanding between the key institutions of the region	5	4	3	2	1
M. Advocating a 'bottom-up' approach to development	5	4	3	2	1
N. Creating a more inclusive Information Society	5	4	3	2	1
O. Increasing access to jobs for all members of Society	5	4	3	2	1
P. Minimising conflict between actors	5	4	3	2	1
Q. Bringing about cost effectiveness	5	4	3	2	1

Question 2. Has your region been part of other initiatives (concerned with regional development and / or promoting the Information Society) that are similar to RISI in terms of goals outlined? If so please name and explain how; (e.g. initiative X places the same emphasis on developing a policy response that is bottom-up)

Question 3. Considering the non-RISI initiatives outlined in Question 2, which (if any) have proved better at achieving these types of goals? Please name and explain how

Question 4. Please explain the strengths and weaknesses of RISI when compared to similar initiatives you have been involved in.

Section 2: Overall evaluation of RISI

Question 5. Have you have attained your strategy plan goals for RISI?
(Please tick the appropriate box)

A. Attained all goals [ ]
B. Attained most goals [ ]
C. Attained some goals [ ]
D. Attained few goals [ ]
E. Attained no goals [ ]

If you have attained some to no goals (C - E) was this because:

A. Your goals were unrealistic [ ]
B. There was an unforeseen change in national conditions [ ]
C. Other, please explain

Question 6. To what extent has RISI raised awareness of the Information Society in your region? *(Please tick the appropriate box)*

A. Across all of the region [ ]
B. Across most of the region [ ]
C. Across some of the region [ ]
D. Across little of the region [ ]
E. Across none of the region [ ]

Briefly explain (e.g. awareness raising was concentrated solely in urban areas, or awareness was raised primarily amongst the young, or the wealthy etc.)

Question 7. Overall which of the following factors were most effective in increasing awareness in the region? Please rank the following: *(Ascribe 5 to that which raised the most awareness and 1 to that which raised the least)*

A. The Media [ ]
B. Schools [ ]
C. Universities [ ]

D. Seminars [ ]
E. Workshops [ ]

Please explain your choice of those ranked first and last and how RISI influenced these factors

Question 8. Between which organisations has RISI most influenced collaborative ties *inside* your region? (For example RISI may have influenced Universities and Businesses to work closer together, or Excluded Social groups and schools, or regional development agencies and city councils)

Question 9. Between which organisations has RISI most influenced collaborative ties *outside* your region? (For example RISI may have influenced Universities and Businesses outside your region to work closer together etc.)

Question 10. As the lead partner and a regional actor who has your organisation best collaborated with as a result of RISI?

Question 11. Of the ties created during RISI, would you consider them to be more formal (ties that came together through concrete links, i.e. joint ventures in projects, working groups etc) or informal (ties between organisations that share information i.e. tacit knowledge, but are not bound to do so) ties?

A. Formal [ ]
B. Informal [ ]
C. A mixture of both, Briefly explain

Question 12. Have you undertaken any initiatives/projects with other RISI regions?

YES NO

If yes, please list the major projects and the regions.

Question 13. Considering your answer to question 12, please list the most successful (and the less successful) of these, and why it is you think they have been so successful (less successful)?

Most successful and why?

Least successful and why?

Question 14. Please state the name of the region with which you collaborated most and consider what the most important factors influencing your choice of partners are. *(On the following please rank from 1 to 8 where 8 is the most important and 1 is the least important.)*
Region

1. Because the project dictated that you work with these regions? [ ]
2. You chose the regions because of very similar industrial and commercial mix? [ ]
3. You and your partner region are of a similar size? [ ]
4. You are both as equally dependent on the same sector of the economy? [ ]
5. Personal / social ties with members of the other regions? [ ]
6. You have collaborated with the respective region(s) in the past? [ ]
7. Pressure from the European Union? [ ]
8. Pressure from local industry? [ ]

Question 15. What has the impact been on knowledge creation/ learning in your region, with respect to the goals outlined in the programme? *(Here 5 is very positive, 1 is very negative and 3 would imply no impact)*

5 4 3 2 1

Question 16. Where was the interchange of knowledge most and least successful? *(Briefly outline what levels of organisational power you thought had best collaborated)*

Question 17. In applying to become part of RISI, which ingredients in your proposal did you think made it successful? (What factors and traits of your region did you emphasise beyond those that were part of the criteria for application, e.g. Objective status of your region)

Question 18. If you have not continued into the next phase of RISI (eris@), please briefly explain why your region has ceased to continue participating in the programme?

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Question 19. Do you agree or disagree with the following statements on how RISI worked overall?

(Here circle the numbers defining how much you agree with the statement. 5 being that you agree strongly, 1 meaning you strongly disagree, 3 that you do not know)

A. Too much work for little tangible reward	5	4	3	2	1
B. Too little work to be of any significance	5	4	3	2	1
C. Over-ambitious	5	4	3	2	1
D. Too politically motivated	5	4	3	2	1
E. Too much reliance on the Information Society as opposed to the more tangible Information Economy	5	4	3	2	1
F. RISI has promoted learning and knowledge diffusion	5	4	3	2	1
G. RISI has brought together many different sections of society in the Information Age	5	4	3	2	1
H. RISI has promoted the economic development of your region	5	4	3	2	1

Question 20. Which of the following do you think have been most influenced by RISI in your region? *(Please rank the following, allocate 5 to the most appropriate, and 1 being the least)*

1. Increased Investment in your region [ ]
2. Increased networking amongst regional actors [ ]
3. Increased awareness of the Information Society [ ]
4. Increased inclusion (Referring to more sectors of society feeling included in the Information Age) [ ]
5. Increased number of jobs and equality of access to them [ ]

Please explain your choice of the highest and lowest

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Section 3. Broader Regional Issues

Question 21. Does your region have a Regional Parliament/Assembly?

YES NO

If yes, briefly describe

Question 22. Does your region have any legislative powers?

Substantial Limited None

Briefly describe

Question 23. Does your region have any taxation powers?

Substantial Limited None

Briefly describe

Question 24. Does your region have any budget powers?

Substantial Limited None

Briefly describe

Question 25. Classify your region according to the following broad groups: *(Please tick appropriately)*

A. A region with broad administrative powers [ ]
B. A region with thin administrative powers [ ]

C. A region without administrative powers [ ]

Question 26. Does your region have enough autonomy from the national level to make a major impact on its developmental path? *(Allocate 5 if you strongly agree that your region has enough autonomy, and 1 if your strongly disagree)*

5 4 3 2 1

Question 27. What impact have EU contributions had on the development of your region?

A. Relative to your national government's contribution

- National contribution has been greater than the European [ ]
- European contribution has been greater than the National [ ]
- Equal contribution by both [ ]

B. Relative to your region's contribution

- Regional contribution has been greater than the European [ ]
- European contribution has been greater than the regional [ ]
- Equal contribution by both [ ]

Question 28. In your opinion, what institutions/organisations are key to promoting development in your region? (e.g. is it the regional development agency or the large foreign multinational company)

Question 29. Is there enough interaction between organisations in the region to make a positive impact on economic growth? YES NO

Briefly explain your answer

Question 30. How have these interactions evolved over time? *(For instance it could be a case of some interactions starting strong before gradually fading, or it could be that some interactions grew stronger with time)*

Question 31. To what extent do you think that RISI has had a positive impact on these interactions? *(Chose 5 if it has been very positive, I if very negative and 3 if RISI has had no impact)*

5 4 3 2 1

Question 32. As a result of RISI, how much more inclusive is your Information Society? *(As above – by inclusive I am asking whether you think that RISI has brought more and varied sections of society into the Information Age, than would have done so without the initiative)*

5 4 3 2 1

Question 33. On which of the following sectors is your region most dependent? *Please rank the sectors below, where 7(the highest) would be ascribed to that sector upon which your region is most dependent, while a 1 would be given to the sector upon which you are least dependent)*

1. Hi-tech Industry [ ]
2. Low-tech Industry [ ]
3. Tourism [ ]
4. Retail [ ]
5. Finance/Banking [ ]
6. Consultancy [ ]
7. Education [ ]

Question 34. From which of the above sectors would you expect the greatest promise for economic growth?

Question 35. Which sectors are most likely to benefit from the Information Society?

Question 36. Does RISI pay particular attention to any of these sectors? If yes, which ones?

Question 37. Briefly describe why promoting the Information Society is important to your region? As in how do you see the benefits of the Information Society manifesting themselves in your region?

Question 38. Please rank the following according to their contribution to your region's development. *(6 being the most important to you and 1 being of least importance)*

1. A region with a very high personal ownership of Personal Computers [ ]
2. A region with broadband access [ ]
3. A region with significantly high computer literacy [ ]
4. A region with a significant amount of employees in the hi-tech sector [ ]
5. A region with a high proportion of low value added computer manufacturing offering a significant amount of employment [ ]
6. A region with research and development orientated software companies offering a relatively small number of jobs [ ]

Question 39. How dependent is your region on inward foreign direct investment (FDI)? *(On a scale of 1 to 5 please indicate how dependent you think your region is on FDI, where 5 is the most dependent and 1 is the least dependent)*

5 4 3 2 1

Question 40. Taking your answer to Question 36 into account list the particular sectors of the economy where Foreign Direct Investment (FDI) is most important. *(Some sectors receive more FDI than others, for instance the manufacturing of computer components might receive more than does the dairy production. Please list the sectors of your economy that are most dependent on FDI)*

Question 41. Do these sectors correlate with those sectors in which RISI is trying to promote the Information Society?

Question 42. Do you think that RISI should promote those sectors that are more internationally competitive?

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Question 43. What makes your region attractive to FDI? *(please rank the following, with 12 assigned to that which makes your region most attractive and 1 to that which is least appealing about your region)*

1. Tax concessions [ ]
2. Grant aid from the EU [ ]
3. Grant aid from the State [ ]
4. Grant aid from your region [ ]
5. Land prices [ ]
6. Labour Prices [ ]
7. Skilled Labour [ ]
8. Proximity to a major market [ ]
9. To reap the benefits of economies of scale – one type of company tends to conglomerate in your region. [ ]
10. The structural fund status of the region [ ]
11. Telecommunications Infrastructure [ ]
12. Physical Infrastructure [ ]

Question 44. Could you briefly describe how you see your region becoming better off as a result of promoting and developing the Information Society in it?

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Thank you for the time you have taken to fill in this questionnaire, it is very much appreciated. Please return it in the enclosed envelope (with stamp coupon) by the 31st of July. If you have any queries or would wish to add further comments please do not hesitate to contact me at the address given.

Appendix 2: List of Interviews by region - July to December 2002

Midwest region:

Industrial Liaison Office – University of Limerick

Managing Director – Microelectronics Application Centre (MAC) Ltd.

Regional Director – IDA

EU Projector Director – Shannon Development

Regional Co-ordinator – Shannon Development

Regional Director – Enterprise Ireland

Research Manager – East Clare Telecottage

Research director – Piercom Ltd

IT Manager – University of Limerick

Director – Midwest Regional Authority

Managing Director – Dell labs Ireland

Personnel Officer – Tellabs Ltd.

Industry Co-ordination Officer – Limerick Institute of Technology

Representative - Dell Ltd. Limerick

Midlands Region:

Regional Director (Midlands) – IDA

Regional Director (Border, Midlands and West) – IDA

Regional Director – Enterprise Ireland

Director – Midlands Regional Authority

Personnel Officer – Ericsson

Research Officer – Ericsson

Managing Director – Systelecom Ltd

Industrial Liaison Officer – Athlone Institute of Technology

Assistant Director – Compulabs Ltd.

Regional Director – IBEC

Regional Director – Midlands Regional Authority

County Councillor - Midlands region

Town Manager, Athlone - Midlands region

Western Region:

Regional Director – Western Regional Authority

Town Manager – County Enterprise Board

Industry Officer – Udaras na Gaelthacta

Managing Director – Sybernet Ltd

Managing Director – Parthus Ltd

Managing Director – Lannet Enterprises

Regional Director – IBEC

Enterprise Officer – Western Development Commission

Industrial Liaison Officer – National University of Ireland, Galway

Regional Director – IDA

Representative – ADC International

Representative – Siebel Ltd

Regional Director – Enterprise Ireland

Southwest Region:

Regional Director – Southwest Regional Authority

Regional Director – IDA

Regional Director – Enterprise Ireland

Managing Director – Vistech Lld

Representative – Motorola Ltd

Representative – Flextronics Ltd

Industrial Liaison Officer – Institute of Technology, Tralee

Research Officer – Institute of technology, Tralee

Director – Equal Skills Ltd

Director – DEIS

IT officer – National University of Ireland, Cork

Research Officer – Southern Health Board

National Level:

Director – National Software Directorate

Regional Director – IDA

Regional Director – Enterprise Ireland

Chairman – Information Society Commission

Minister Michael Ring TD

Appendix 3: Components of the Information Society Index

The ISI includes 23 indicators measuring the capacity of a nation's citizenry to exchange information internally and externally

- **Computer Infrastructure:** PCs per capita; Home PCs shipped per household; Government/Commercial PCs shipped per professional workforce; Education PCs shipped per student and faculty member; Percentage of networked PCs; Software/Hardware spending.
- **Internet Infrastructure:** Amount of e-commerce considered as transactions carried out on-line; No. of Internet home users; No. of internet business users; No. Internet education users.
- **Information Infrastructure:** Telephone lines per household; Telephone faults/lines; Cost of local call; Television ownership per capita; Radio ownership per capita; Fax ownership per capita; Cellular phones per capita; Cable subscribers.
- **Social Infrastructure:** Secondary school enrolment; Tertiary school enrolment; Newspaper readership; Press freedom; Civil liberties.

Appendix 4: Broadband, Definitions and Technical Terms

BB connectivity is the tool that delivers fast internet access, as well as video on demand, video conferencing and web hosting. BB capacity is measured by the rate of transmission or bandwidth in bits per second. The minimum is 2Mbit/s but customers can require up to 34 and 155Mbit/s. high technology companies such as internet data centres (IDC) frequently require in excess of this.

The BB Network
Can be viewed in the same way as road network. – more users more traffic and there are Primary, Secondary and Tertiary roads – four main components:

1. International Links – direct international links connecting international locations. The completion of 2 transatlantic fibre cable projects means that Ireland has what is regarded as world-class international connectivity at a competitive price.
2. Backbone Network – high capacity networks (usually fibre) connecting cities and towns = national primary roads.
3. Backhaul Network (trunk network) – connections between the national backbone and local telephone exchanges (approx. 1,100) – secondary and tertiary roads. This helps determine the quality of access to SMEs and residential users. The type of exchange (with fibre or copper) will help to determine the possibility of delivering new technologies. For example, approximately 25% of the truck network in Ireland is based in copper networks rather than fibre. (which are more likely to be located in rural regions in the Gaeltacht = 50%)
4. Local Access Network – access from each business and home to the backbone via the backhaul network = driveway connecting every business and home of the road network. This has been the weakest link in the infrastructure within the Western Region because it consists mainly of copper cables and therefore the capacity is restricted to 2Mbit/s.

BB technologies

(Some people call technologies that deliver up to the minimum BB technologies, BB – some do not)

1. *Copper Cable/PSTN* – the general telephone services network is based on a single copper cable and is termed Public Switched Telephone Network (PSTN). It is a single channel with dial-up (dial-up requires dialling up for an internet connection and is in contrast to always-on) therefore voice and data cannot be transmitted simultaneously. It transmits voice at a speed of 64kbit/s and data at speeds of up to 56kbit/s. PSTN is available throughout Ireland and most home internet use is still accessed through this technology.
2. *ISDN – Integrated Services Digital Network* – instead of the normal single copper cable, ISDN provides two channels thereby allowing voice and data transmission simultaneously. This is also dial-up and can provide data transfer of up to 2Mbit/s. to avail of the service, customers must be located up to a distance of six kilometres from the nearest exchange.

3. *Leased Lines* – is a copper or fibre circuit that has been leased for private use. It is always-on and provides dedicated bandwidth to the user. Leased lines can provide speeds of up to 2.5Gbit/s, but typically provide speeds of up to 2Mbit/s. (1 Gigabit/s = 1,000 Mbit/s). There are approximately 31,500 leased line circuits in use in Ireland of which 95% are under 2Mbit/s (there are approx 22,000 retail lines and 9,500 wholesale leased lines). Large companies often use leased lines to connect to different sites of the business.
4. *Digital Subscriber Line Technology* – DSL allows customers to access the internet and use the telephone simultaneously over existing copper telephone lines. DSL requires the installation of equipment at both ends (the users premises and the local exchange) with digital technology. It is always-on and access speeds are up to 30 times faster than a standard telephone line. Capacity of up to 2Mbit/s. Access speeds depend upon the length of the copper line to the exchange, so the longer the distance the slower the speed, availability is limited by distance – three kilometres from the nearest DSL equipped exchange. Services were launched in Ireland in May 2002 and there are approximately 1,200 DSL lines in operation (the DSL that is available in Ireland as ASDL – Asymmetric Digital Subscriber Line). To date (end 2002) DSL is only available in larger centres. By the end of January 2003 services in the west will be in Galway, Athlone, Sligo, Ballina, Ballinasloe and Westport. There is little commercial reason for rolling out DSL services to smaller centres where it is perceived that there will be a limited take-up. DSL is most appropriate for the SME and home user.
5. *Cable Modem (Cable TV)* – a device that connects a computer to an existing cable TV line that can transmit data at high-speeds. Could be up to 30Mbit/s but not in Ireland without a cable upgrade – in practice speeds of 1-2Mbit/s are realisable. Currently there are only 1,000 cable modem subscribers in Ireland (this service, delivering 512kbit/s is offered by NTL)/ It is only available in Dublin (on-trial). Half a million cable TV subscribers in Galway, Cork, Dublin, Waterford, Limerick – they are the only target.
6. *Fibre Optic Cable* – can provide speeds of up to 80Gbit/s and is the most future proof of all transmission methods. Most of the backbone network is composed of fibre. Telecommunications providers are gradually extending to the backhaul network. One of the most expensive as it requires laying underground. Widely used by the larger – Government, higher ed and large companies – along with most IDA business parks.
7. *BB wireless local loop* – this technology transmits nigh-speed internet services via radio-waves – from 64kbit/s to tens of Mbit/s. It is limited by a distance of between one and 35Km depending on the frequency used. It is currently not openly deployed in Ireland. Three companies have been offered the licences but they have only around 200 customers. Chorus' licence was revoked in the BMW region – it having failed to deliver the service. (due to the current poor commercial environment). (Formus Communications Limited received funding under the NDP but has since gone into liquidation)
8. *Wireless LAN* – provides BB deployed over radio-waves – needs no licence. Can go up to 54Mbit/s but usually goes for the European average of 11Mbit/s. It can be installed relatively quickly and cheaply. It is designed to link computers and other data processing devices within a small geographic area because of its short range up to 10 km. Usually deployed in Airports, Conference centres, but have been used in office environments.

9. *Satellite (VSAT)* – refers to one form of satellite transmitted internet access. Always-on suitable for voice and data. Transmission speeds are asymmetric with download capacity greater than upload capacity – typical speeds are up to 350kbit/s upstream and 2Mbit/s downstream. Transmission requires a line of sight between the user and the satellite – long distances can cause delays making video-conferencing unusable. Unlike terrestrial BB, it is much more suitable for remote regions as it does not require cabling. Not widely available but pilots have been carried out – see below.
10. *Third Generation Mobile* – not yet available but us expected to provide speeds of up to 2Mbit/s. Comreg have given out 3 licences – two of them will be providing services to a minimum of 53 percent of the population, which corresponds to the 5 major cities. The other is required to provide services to 80 percent of the population – this means there will be only one provider of 3G services in most of the Western region – consequently there will be limited competition.

In terms of Broadband Speed – Highest to the Lowest

1. Fibre Optic Technology with ATM/STM1 and DWDM Technologies up to 80Gbit/s
2. Leased Lines (fibre) – Always-on up to 2.4Gbit/s
3. WLAN – Always-on up to 54Mbit/s
4. Third Generation Mobile up to 2Mbit/s
5. DSL – Always-on up to 2Mbit/s
6. Satellite (VSAT) – Always-on 95 kbit/s – 45Mbit/s
7. Cable modem – Always-on 100's kbit/s – 30Mbit/s
8. BWLL – 64kbit/s – 10'sMbit/s (FWA)
9. ISDN Dial-up 128kbit/s – 2Mbit/s
10. PSTN Dial-up 56kbit/s

(WDC, 2002)

Table X. Currently available narrowband and broadband technologies

Technology	Typical Speed	Cost	Availability
Copper/PSTN	56k (dial-up)	Monthly rental charge €16	Widespread
ISDN	ISDN Basic – 2x 64k (Dial-up)	Installation - €244.99 + modem - €121 _monthly rental fee ranging from €20 -€37	Widespread within 6km of nearest exchange
	ISDN Primary – 30x 64k (Dial-up)	Installation - €3,958 +monthly rental fee €70-264	
Leased Line Copper (90% non-BB)	Up to 2Mbit/s (Always-on)	2Mbit/s (2km circuit). National ave = €651 p/m 2Mbit/s (5km circuit). National ave = €1,461 p/m	Widespread
Leased line – Fibre Optic cable	Up to 80Gbit/s (Always-on)	Prices vary depending on capacity. Ireland positioned 7th out of OECD countries got national leased line costs	Limited to large data users
DSL Basic	DSL 128kb upstream & 512kb downstream. (Always-on)	€125 - €165 installation + modem €145 + rental €89 per month for 3Gbit quota.	Designed for SME/home. Limited by approx 3km from exchange
DSL 2Mbit/s	DSL 512kb upstream & 2Mb downstream (Always-on)	€1,500 installation + rental €400 per month	Designed for SMEs. Limited by approx 3km from exchange
Cable Modem	128kb – 1Mb (Always-on)	€100 installation +rental, 128kb €30p/m, 512kb €40p/m	Not widely deployed but trial underway
Satellite VSAT	95kb – 45Mb (Always-on)	€1,500 installation, 128kb upstream and 400kb downstream = €100 – 170 p/m	Not widely deployed but trial underway
Wireless LAN	256kb – 54Mb (Always-on)	256kb upstream & 512kb downstream. Business users - €100p/m + installation €1,500. Home users - €30 – 50p/m	Limited by up to 10km
BWLL or FWA	64kb – 10's Mb	BB service not widely deployed	Limited by distance 1 – 35km

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